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# SOME PERSPECTIVES ON PLANNING AND DEVELOPMENT WITH PARTICULAR REFERENCE TO KERALA

— A Preliminary Paper on the Approach to the Fifth Five Year Plan

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# SOME PERSPECTIVES ON PLANNING AND DEVELOPMENT WITH PARTICULAR REFERENCE TO KERALA

— A Preliminary Paper on the Approach to the Fifth Five Year Plan*



Planning has been done in India so far mainly by giving a broad direction to the pattern of development of the economy through the use of resources available to the Central and State Governments from taxation, internal borrowing, profits of State enterprises and foreign aid. These resources have been utilized to build up overheads of development such as irrigation and power, transport and communications, certain key industries like steel, and facilities for scientific and technological research. A substantial infra-structure has been thereby built up in the course of the last two decades and this provides a basis for more rapid development in the future.

It is evident that this kind of partial planning of resource use has helped to stimulate the processes of growth. The rate of growth of output in the economy has been on the average more than twice as high as in the period before Independence. In some sectors of the economy, and more particularly in certain regions, there are even signs of a general break-through.

But the limitations and weaknesses of the growth process that has been generated are equally evident. The most obvious is that it has had no perceptible impact on the problems of mass poverty and unemployment. A related feature is that inequalities in the distribution of wealth and income have apparently increased. The resulting

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* ~~This draft is subject to revision before~~ publication.

social discontent and conflict — which manifest themselves in a variety of ways — have now assumed serious proportions and set in motion a process of re-thinking on the approach to development followed hitherto.

The most important outcome of such re-thinking so far is the decision taken recently to impose ceilings on land holdings on a more or less uniform basis throughout the country. But it has come too late and it is doubtful whether the proposed measure goes far enough to yield any significant results. As early as 1955 a Panel on Land Reforms set up by the Planning Commission had suggested that "a farm which yielded a gross average income of Rs.1600 or a net income — including the remuneration for family labour — of Rs.1200, and not less than a plough unit or its multiple in area, may be considered as a family holding", and that the ceiling might be fixed at approximately three times the family holding. If this proposal had been implemented at that time the surplus land available would have been sufficient to provide a high proportion of the rural households with holdings yielding arcund Rs.1200 per annum at the prices then prevailing. The Planning Commission did not however take any firm decision on the recommendations of the Panel and left it to the States to decide the basis of fixation of ceilings. The ambivalence and dilatoriness that characterized the approach to this question in the subsequent decade and a half made it worthwhile and possible for most of the holdings which could have yielded surpluses for distribution to dispose them off in a variety of ways. Since the ceiling now proposed is also somewhat more liberal than was recommended earlier it would be surprising if more than 1 to 2 per cent of agricultural land becomes available now

for redistribution. As a solution to the problems posed immediately by rural poverty and unemployment it would be unrealistic therefore to expect much from this measure.

Anticipating this possibility greater emphasis is now being laid on public works programme for providing larger employment and incomes to the poorer sections of the population supplemented by "a national plan for the provision of social consumption in the form of education, health, nutrition, drinking water, housing, communications and electricity upto a minimum standard". In effect this is the new orientation which the Planning Commission proposes to give to the Fifth Five Year Plan. As the Commission itself points out the approach to the Fifth Plan outlined by it "places special emphasis on the basic amenities which meet the needs of those among us who are the poorest" and "this marks a departure from earlier Plan formulation and programmes".

There is no doubt that greater reliance on public works programme is a shift in the right direction, since they can not only help to increase employment and incomes among the poorer sections of the population but contribute to strengthening the infra-structure for development all round. The methods adopted for raising the necessary resources, and for framing and executing the programmes, are however likely to make considerable difference to what is actually achieved. It is possible to conceive of ways in which public works programmes could be used to increase output, stimulate saving, and mobilize resources that would otherwise not have been available for development; but it is also possible — as is generally the case — for public works programmes to deteriorate into a disguised system of doles resulting in large-scale

wastage of resources. Moreover there can be serious difficulties in building up and maintaining public works activity on a scale that would provide adequate employment on a more or less continuous basis for large numbers of people. These limitations of public works programmes need to be recognized as much as their potentialities.

In this context another weakness of the growth process that has been in evidence needs to be emphasized. It is that neither the rate of growth of output nor the rate of domestic saving in the economy has as yet risen high enough to provide adequate resources for meeting the minimum requirements of development. This has been brought out by the Planning Commission itself in its Mid-Term Appraisal of the Fourth Plan.

In fact the rate of growth of output in the first three years of the Fourth Plan period has been only about 4½ per cent per annum, compared to the target rate of 5½ per cent; it seems likely that the inclusion of the current year will bring down the average rate still further. The rate of domestic saving has been almost stagnant at around 8 to 8½ per cent of the national income for the last five years though it had touched over 10 per cent in the preceding five years and the Fourth Plan had visualized raising it to 13¼ per cent by 1973-74. The rate of investment also — which ranged between 12 and 13 per cent of the national income between 1962 and 1967 — has fallen even more sharply and remained at around 9½ per cent of the national income since 1968-69. The observed decline in the dependence on foreign aid in the Fourth Plan period cannot itself therefore be interpreted as evidence of greater capacity to sustain development on

a self-reliant basis; it is essentially a reflection of the reduced tempo of investment activity which is the antithesis of development and has been responsible to no small extent for the recession in the industrial sector.

The position the Planning Commission has chosen to take on the question of resources for the Fifth Plan is therefore difficult to understand. Apart from asserting, Not only does it assert that "the economy has now reached a stage where larger availability of resources makes it possible to launch a direct attack on unemployment, under-employment and poverty, and also assure adequate growth", it has ventured the but it ventures the estimate that in order to carry out the proposed employment and minimum needs programme while sustaining the required rate of growth of the economy, the total level of outlay in the Fifth Plan period would have to be around twice the size of the Fourth Plan. It is most unlikely that such a doubling of the outlay would be feasible without generating serious inflationary pressures in the economy and/or increasing greatly the dependence on foreign aid.

It would be of course possible to produce estimates of resources corresponding to the proposed outlays on development. In the past this has been done mainly by postulating high rates of growth of output and high rates of saving out of the increases in income so realized. The basis of the resource estimates made for the Draft Outline of the Fourth Five Year Plan is worth recalling in this context.

The assumed rate of growth of commodity production during the period of the Fourth Plan was assumed to be 7 per cent per annum even though it had not exceeded 3 per cent per annum in any of the previous

Five Year Plans. The domestic resources needed to support the proposed investment outlay of Rs.21350 crores in the Plan still required between 30 and 40 per cent of the increases in income being saved annually during most of the Plan period; it was assumed that this too could be realized, in spite of there being no evidence of the marginal rate of saving being ever maintained earlier at more than 20 per cent of the recorded increases in income.

Since most of the increases in development outlay were to take place through the public sector it had to be demonstrated that adequate resources would be available to it for this purpose. This was done by assuming that between one-quarter and one-third of the increase in national income each year would accrue to the government as additional tax revenue and that a high proportion of it would be saved by the government. Consequently public sector saving was estimated to increase from 1.6 per cent of the national income in 1965-66 to 5.2 per cent of it in 1970-71, while private sector saving was expected to increase from 8.9 to only 9.8 per cent of the national income during the same period.

It is interesting to observe in retrospect that drought and suspension of American aid prevented the Fourth Plan getting off the ground in 1966; and that, when it finally got launched in 1969 the proposed investment outlay in terms of money was only 6 per cent higher than in the Draft Outline, even though the general price level had risen by more than 25 per cent in the intervening period and the rate of growth of output aimed at in the Plan was lower than suggested earlier. The proportion saved by the public sector out of the increases

in its income has fallen from over 21 per cent in 1965-66 to 9½ per cent in 1970-71 and less than 7 per cent in 1971-72 — with the result that the total saving of the public sector was less than ¾ per cent of the national income in 1971-72. Apart from the cuts in the investment programme necessitated by the low rate of saving in the public sector the rise in prices since 1968-69 has further brought down the real value of the investment outlays. Not surprisingly, the levels of production expected to be achieved by 1973-74 in respect of important items like foodgrains, chemical fertilizers, steel, petroleum, coal, steel castings and forgings, and diesel engines are considerably lower than the targets set for them in 1968-69 — and this despite a number of optimistic assumptions made by the Planning Commission in its Mid-Term Appraisal of the Plan.

No doubt different reasons can and will be cited for the shortfalls in performance in different sectors of the economy. It is important however not to lose sight of the inter-industrial and inter-sectoral relationships on which a programme of development has to be based and which, if upset, will inevitably get reflected in shortages of output in some and excess capacity in others. This is the phenomenon that has been in evidence in the Indian economy for some time; and the responsibility for it should be traced to a large extent to the lack of realism, discipline and rigour at the stage of formulation of the Five Year Plans.

There is a serious danger of the history of the Fourth Plan being repeated in the formulation and implementation of the Fifth. If the total developmental outlay in the period 1974-79 is to be twice as

high as in the Fourth Plan it will work out to nearly Rs.50,000 crores at 1970-71 prices. Since the responsibility for executing the proposed employment and minimum needs programme will be mainly that of the public sector, its outlay will probably need to be raised from the Fourth Plan level of around Rs.16,000 crores to nearly Rs.35,000 crores It would be of course possible to show that all this is feasible on certain assumptions; and that, given the validity of these assumptions, there is a profile of investment and output that is both inter-sectorally and inter-temporally consistent with the targets laid down for income, consumption, employment, attainment of self-reliance, etc. This is presumably what is being attempted in the paper now under preparation on the dimensional hypotheses of the Fifth Plan; and it is on the basis of this paper that guidelines are to be framed for preparing the Draft Outline of the Plan and for the size and content of the State Plans. But what has to be questioned even at this stage are the assumptions on which the whole exercise is based; for if it is not done now it would be too late to retrace the steps, and the social and economic consequences of persisting with the approach laid down meanwhile might prove to be extremely serious.

## II

It is of course not enough merely to dispute the validity of the approach suggested by the Planning Commission. One needs to put forward an alternative that could be considered in its place.

The first thing that has to be recognized in this context is that, despite all the measures of land reform and nationalization undertaken in the past and now being contemplated, the distribution of wealth in India has been and will continue to be extremely unequal. Income distribution is of course always less skewed than distribution of wealth, and the distribution of consumption still less so. Nevertheless, as the Planning Commission has itself pointed out (Fourth Five Year Plan, 1969-74, p.34), a quarter of the total consumption in the economy is accounted for by the top decile of the population, and two-fifths of the total consumption by the top one-fifth of the population. If the "people living in abject poverty constitute between two-fifths and one-half of all Indian citizens", and they are to be provided with a basic minimum standard of consumption within a short period, it can be done only through a drastic redistribution of consumption. Even if cuts are to be made in the consumption of only the top decile of the population it would affect families with annual income of no more than about Rs.3000 to 4000 at the prices currently prevailing. The basic question that has to be asked is whether this is politically feasible.

Secondly, the consumption levels of the people living in abject poverty cannot be brought about merely by a redistribution of wealth or income. Since the products required by these people for raising their standards of living would be different from those that the higher-income groups might be willing to do without if they are required to reduce their levels of consumption. The entire pattern of production in the economy will have to be modified substantially. This can be

done, but an inevitable consequence to be faced in the transition period will be considerable pressure on the supplies of the most essential consumer goods — which might require rationing of these goods on an extensive scale — and emergence of both unutilized capacity and unemployment in industries and economic activities catering hitherto the consumption needs of the upper-income groups. The question to be considered once again is how far this is likely to be politically feasible within the present power structure and organizationally manageable.

Answers to these questions cannot be given by economists or others on purely technical considerations. But in so far as a judgment can be made taking into account the balance of social and political forces in the country now, it appears that the problems involved in adopting a strategy of this kind are likely to be formidable and that any such effort without the necessary political and organizational backing might prove to be self-defeating. In fact it is difficult to see how it can be otherwise when almost all the organized political forces in the country — including those which are committed to radical policies — depend to a large extent on the support of those who would be adversely affected by a programme that has implications of the sort indicated. [illegible] (of the kind indicated will in all [illegible] require a [illegible] social and political environment substantially different from

If this is a reasonably correct assessment of the social and political factors relevant to planning in India today it is important to face them squarely and not get lost in the details of technocratic exercises which in effect avoid the issues involved by making totally unrealistic assumptions. It is of course possible to take the view —

and it may prove to be correct — that radical social and economic transformation cannot be brought about in India through planning within the existing framework and that considerable dislocation and disorder are unavoidable concomitants of the process. But it would be strange if those who do not wholly share this view, and look upon planning as at least a means of minimizing the stresses and strains involved in the transformation, accept uncritically an approach that could bring planning itself into disrepute without achieving what it is otherwise possibly capable of.

The shortfalls and the weaknesses in performance highlighted in the Mid-Term Appraisal of the Fourth Plan make it clear that the national income in 1973-74 is unlikely to be more than about Rs.40,000 crores at 1970-71 prices. Even this may be difficult to achieve. In framing the Fifth Plan it would be wise to make estimates and progremmes on alternative assumptions about the rate of growth of output that can be realized during the period. A relatively modest but safe assumption to make would be that this rate might not exceed 5 per cent per annum; but the possibility of doing better could be allowed for by attempting another set of estimates and programmes based on an assumed rate of growth of 6 per cent per annum. To postulate any higher rate of growth appears unwarranted on the basis of the experience upto now.

As indicated earlier, the rate of investment in the economy has been only around 9½ per cent of the national income for some years now. The first priority in a development programme that seeks to achieve accelerated development on a self-reliant basis has to be

to raise this rate. It is assumed in the Mid-Term Appraisal of the Fourth Plan that the rate of investment will be around 11 per cent of the national income by 1973-74. But it has to be raised substantially more and one of the first things to be decided is how much can be realistically attempted in this direction in the Fifth Plan period.

An earlier projection referred to in the Mid-Term Appraisal places the target for investment in 1980-81 at about 16 per cent of the national income. This still appears to be as high as the country can hope to achieve by the end of this decade. Even assuming that the rate of domestic saving will have been raised to 11 per cent of the national income by 1973-74 (from the level of around 8½ per cent realized in the last few years), it would require additional saving of a considerable order as output and income grows during the Fifth Plan period. If the rate of growth of output realized during this period turns out to be 6 per cent per annum, the additional saving needed will be only around one-sixth of the increase in income each year; but if the rate of growth of output is lower (say, no more than 5 per cent) — as it might well be — one-fourth or more of the annual increases in income will be needed to be saved throughout the period. This implies as substantial a savings effort as can reasonably be expected within the institutional framework of the Indian economy.

But even if accelerated growth of output and saving at the rates indicated can be achieved during the Fifth Plan it would be impossible to sustain a total investment outlay going beyond the range of Rs.32,000 to Rs.35,000 crores over the period. To establish the

feasibility of an investment programme of this magnitude without heavy dependence on foreign aid one needs also to examine the foreign exchange implications of the planned growth in production, consumption and investment. Recent developments — more particularly the relatively low rate of growth of exports and sharp rises in domestic prices — suggest that if this dimension is taken into account the resource constraints are likely to be even more severe.

All these estimates are in terms of net investment i.e. excluding the investment undertaken in the economy each year in replacement of depreciated assets; the corresponding saving estimates relate to net saving — which similarly excludes the provision made each year to cover depreciation and replacement. There is a strong case however for replacing them by estimates of gross investment and gross saving in the economy — since part of the stimulus to growth in all countries comes from qualitative changes in productive assets brought about in the course of replacement of earlier ones, and the savings provision made within each enterprise and industry in anticipation of future replacement requirements can be utilized meanwhile for investment elsewhere. Available estimates show that in India the resources set apart for depreciation and replacement of assets each year have been about 5 per cent of the gross national output; so, if this change in the method of presentation is made, the total investment outlay in the Fifth Plan period would appear to go up by Rs.12,000 to Rs.15,000 crores. In this way a developmental outlay of around Rs.50,000 crores in the Fifth Plan period can be shown to be feasible; but this, it will be evident, would reflect mainly a change in the

method of accounting and not a doubling of the outlay compared to the Fourth Plan period as proposed by the Planning Commission.

If this assessment of what can be realistically attempted by way of saving and investment effort in the Fifth Plan is correct, the real expansion in outlay compared to the Fourth Plan period can be no more than about 50 per cent. The challenge the country faces today is to achieve its objectives to the maximum degree possible by mobilizing an effort of this magnitude and utilizing efficiently the resources so mobilized by strict enforcement of the priorities implicit in such an approach.

Admittedly, this estimate of resources for development is based on conventional notions of what can be secured through the usual processes of saving and investment. More can be achieved to the extent that idle manpower in the country is mobilized through appropriate social, political and administrative organization for developmental purposes. Such mobilization of idle manpower can of course be also assisted by a certain measure of financial support from the government or through credit institutions set up for the purpose; but the emphasis here would need to be on organization and productive goals, rather than on finance and employment, if it is not to result in wasteful use of resources and loss of faith in the potentialities of this method.

An important implication of the approach to the Fifth Plan outlined above is that very great care and control will have to be exercised in allocating resources as between competing demands. It will certainly require the application of much stricter criteria in approving projects and schemes for the Plan than has been evident

hitherto. The country cannot now afford the luxury of setting up steel plants to supply stainless steel for industries manufacturing utensils; or purchase Jumbos at prohibitive cost in terms of foreign exchange and then relax controls over foreign travel in order to make use of the surplus capacity so acquired; or expand television facilities to cater to the tastes of an infinitesimally small proportion of the population in the metropolitan areas; or launch out on schemes such as for the linking of the Ganga with the Cauvery without even the pretence of a cost-benefit analysis. These are but a few examples of the kind of wasteful use of scarce resources that has been permitted by the Planning Commission, and which represent really the negation of all that planning should really stand for today.

III

There is little doubt that, even if a less ambitious (but possibly more realistic) approach of the kind indicated is adopted in the formulation of the Fifth Plan, considerable progress can be made towards the achievement of the objectives laid down. It is possible to illustrate this with reference to some of the possibilities in Kerala.

The bulk of the resources available to the State Government so far for development have been absorbed hitherto by irrigation and power projects and by expansion of education and health services. Part of such investment has been helpful to development, but a not inconsiderable part has been essentially wasteful and could have been put to better use.

A criticism commonly made about the developmental programme of the State is that education has been allowed to absorb too high a proportion of the financial resources of the State. There is some substance to this criticism in that the Government expenditure on education accounts for over four-fifth of the total revenue from State taxes and duties. One has however to be careful when passing a judgment on the appropriateness of the policy followed in the State in respect of education. For more than 50 per cent of the expenditure has been on primary education, and the rest has been devoted mainly to secondary and various types of vocational and technical education; university education accounts even now for less than 5 per cent of the total expenditure on education by the government.

There is a case for examining closely the structure, organization and content of higher education in the State. It is fairly obvious that, as in the rest of India, higher education is not related in any meaningful way to the requirements of development and results in considerable wastage and mis-direction of resources. But one has to be more careful when passing a judgment on the policy followed in respect of primary and secondary education. In a society in which the scope for reducing inequalities of opportunity is limited, and the potentiality for development itself rests to a large extent on the application of science and technology to the processes of production, such investment in education cannot be regarded as necessarily wasteful. What is worth looking into more closely is the possibility of charging fees on a graduated basis with respect to income, thereby ensuring that educational services are not made free for even those

who can afford to pay. It is also necessary to explore the scope for giving a stronger vocational orientation to education at all levels.

That investment in education and health services, however expensive they might appear, could have other pay-offs is evident from the degree of popular response evident in Kerala to the facilities provided for family planning. If such facilities are provided on a more extensive scale it now seems possible that the birth rate in the State can be brought down significantly within the next decade; this again is mainly a question of organization, and requires additional finance only on a modest scale compared to the saving of resources in the future that can be achieved thereby. Should such a programme prove to be successful, as there is good reason to expect, the indirect rate of return on the investment made hitherto in education and health services will be found to have been very high.

It is obvious however that the expansion of educational facilities, not accompanied by a corresponding growth of the productive base of the economy, has led to serious economic imbalances — reflected in the high rate of open unemployment in the State — and generated social tensions. What has to be now considered therefore is how the human capital that has been built up can be utilized for developing the productive base of the economy to the necessary degree and what changes need to be made for this purpose in planning policies and techniques.

The bulk of the investment made in the State for developing the productive base of the economy has been in irrigation and power. They have accounted so far for over 45 per cent of the total developmental outlay in the State Five Year Plans. Industry and mining, on

the other hand, have received much less than 10 per cent of this outlay. investment by the Central Government on industrial projects located in the State does not make a significant difference to this over-all picture, as the total investment on such projects between 1951 and 1968 has amounted to less than Rs.70 crores.

Irrigation and power are no doubt important overheads essential for agricultural and industrial growth, and the importance attached to them cannot therefore be questioned. There is however reason to doubt how far the facilities created by such investment have been actually effective in promoting such growth.

The main reason for according high priority to irrigation has been the chronic rice deficit in the State and the consequent emphasis placed on increasing the internal output of rice. Naturally, the main focus of irrigation development has been on rice; as of 1969-70, about 81 per cent of the gross irrigated area in the State was accounted for by paddy. However, paddy continues to be a predominantly rainfed crop. In spite of the proven advantage of the Punja (summer) season, about 89 per cent of the area under paddy is still under Virippu (autumn) and Mundakan (winter) crops. As will be evident from the attached note on the growth of rice output in Kerala between 1950-51 and 1970-71, the expansion of irrigation (has not) made any significant impact on the seasonal pattern of rice cultivation in the State. Inadequate irrigation facilities during summer still appear to be a major constraint on extension of area under the summer crops. (The) yield rates of the autumn and winter crops could be also considerably increased by improving the drainage facilities of the low-lying paddy fields which are subject to water-logging. Another lacuna in irrigation policy is the neglect of the garden land. Investments in drainage, contour bunding and soil conservation on the slopes of hills, exploration of ground water resources, etc., can generate higher rates of growth in agriculture as well as additional employment (both directly and indirectly).

(8) See Appendix I

Moreover, on account of the conventional importance attached to major irrigation projects and the local political pressures generated by it, too many of them have been taken up for execution at the same time and their completion delayed for lack of adequate financial support. Such delays have resulted in considerable escalation of costs, in resources getting tied up without any results to show, and in introducing a degree of incoherence in planning that has had other serious consequences.(x) This is of course symptomatic of the kind of wastage that takes place at both the Central and the State level when the outlay required on "approved" projects and schemes is far in excess of the resources available to carry them out and the necessary cuts are made not on any rational basis — as one would expect under planning — but in an almost anarchic fashion. It is however a matter in which the necessary discipline can be enforced with some improvements in the methods of plan formulation and implementation and with fuller understanding at the political level of the reasons for enforcing such discipline.

As in the case of irrigation, it is not clear how far the development of power generation and transmission in the State has helped to stimulate agricultural and industrial growth. Only about 2 per cent of the electricity now consumed in the State is used for agricultural purposes, in spite of the extensive rural electrification programme that has been undertaken; this again is a reflection of the failure to explore the possibility of use of groundwater resources. Industrial consumers account for nearly three-fourths of the total electricity consumed, but the progress made in the utilisation

(x) See Appendix IV

of electricity by small and medium-scale industries has been still very limited and more than 80 per cent of the industrial consumption is traceable to a few large-scale units (such as the F.A.C.T. and Indian Aluminium) requiring extra high tension supplies of power. The potential for the development of hydro-electric power in Kerala is still considerable, and so are its uses for sustaining rapid growth of agriculture and industry; but investment in power generation is likely to prove too costly relatively to the benefit secured unless it is linked closely with a much more broad-based development of small and medium scale enterprises in these sectors, and an adequate system of distribution is built up to ensure supplies uninterrupted by frequent breakdowns and heavy losses in transmission as is largely the case now.

In fact the basic weakness of planning in Kerala so far (as in most other parts of India) has been that no serious effort has been made to visualize and translate into concrete form a pattern of develo ment that can fully utilize and be therefore supported by the resourc endowments of the region. Consequently many of the projects and schemes proposed and implemented as part of the Five Year Plans have not had the potential for initiating a process of development that could strike root in the region and gather momentum over a period of time. Even those which had such potential have not been adequately supported by the kind of related investments necessary to bring it ou

An important task that has therefore to be undertaken now — before the Fifth Plan for the State is given concrete shape — is the formulation of a perspective about the pattern of development most

appropriate to the resource endowments of the region. This will of course take some time to work out in detail, but the basis on which such an exercise might be attempted can be indicated very briefly.

For instance, it is evident that though the main focus of attention in agriculture hitherto has been on increasing the production of rice on the 'wet' land in the State, the greater part of the income from agriculture comes from a variety of other products grown on 'garden' land. Moreover, since 'wet' land accounts only for about a quarter of the total area of land in the possession of agrarian households, a broad-based growth of income in this sector depends obviously on the scope for raising the productivity of 'garden' land as well. A preliminary examination of the possibilities indicates that the scope for doing so is very considerable.

Most of the garden land in the State is occupied by coconut, mango and jack-fruit trees; black pepper and other spices, cashew-nut, and tapioca are also grown alongside in many areas. This product-mix is largely a reflection of the technological possibilities as known upto now to most people in the State. But the market conditions for some products have considerably changed; scientific research has opened up new possibilities of multi-crop development of garden land which can raise the average yield from such land to several times its present level. For instance, mango and jack-fruit have now probably relatively very little commercial value (compared to the alternative crops that can be grown on the same land) and it is not worth wasting so much land on them. Coconut is still highly remunerative; but if coconut trees are not clustered together but spread out with adequate spacing between them, not only can the output of coconuts from any given area of land

(see Appendix I)

be increased but various other products of high value (such as cocoa, cloves and soya-beans) grown in between them in many parts of the State. New dwarf-varieties of cashew-nut trees have also been developed which make it possible to achieve a higher yield from a smaller area of land. Similarly new varieties of grass are now available which have such nutritional properties and grow so rapidly that, if planted along the fence on a piece of land no more than one-tenth of an acre in size, the output would be adequate to meet the greater part of the feed requirements of a cow.

Knowledge of this kind and covering a variety of products that can be grown in Kerala is now available in the numerous agricultural research stations spread throughout the State. But the extent of its diffusion has been so far very limited. Moreover, most of these research stations — which usually specialize in one product or the other — have not examined the problems raised by and the potentialities of multi-crop development on different types of land and under different climatic conditions. There are however sufficient data in their possession to experiment with different patterns of product-mix under different conditions and thereby evolve optimal patterns appropriate to each of the main categories of garden land in the State.

A feature of the crops grown on garden land that has to be kept in mind is that the period of waiting involved is in some cases several years long and that many of the plants, once they mature, have a long life. Similarly some require considerable input of labour on a more or less regular basis, while others need very little. The problems involved in the choice of an optimal product-mix on

garden land are therefore quite complex, and have a great deal more in common with those faced in the planning of industry than with those normally associated with agriculture. But they can be sorted out by careful analysis and experimentation, and solutions found for increasing substantially the problems obtainable from even very small holdings of garden land. Some solutions can also be found in this way to the problems of under-nourishment and malnutrition in the State.*

There are other similar areas of potential development related closely to the resource endowments of the region. Fisheries is an obvious one. Already, on the basis of relatively small investments, the exports of fish from Kerala have increased more than six-fold since 1965-66; and there is little doubt that more investment will yield very high rates of return. But, in order to be effective, such investment will be needed in a number of inter-related fields — more particularly in harbour facilities and fishing vessels of the kind required for deep-sea fishing. There is also considerable scope for the development of prawn and frog culture along modern scientific lines in the inland waters of the State. Poultry is already an important source of income for the poorer sections of the rural population, and Kerala is a large-scale exporter of eggs to other parts of the country. But it is capable of much greater development, particularly if the further expansion of fisheries makes it possible to supply fish-meal at low cost as poultry feed. Poultry in turn is an important source of phosphatic fertilizer and can help to increase the productivity of crops grown on garden land.

* Appendix IV

Apart from the natural resources of the kind referred to above, the relatively educated and skilled labour available in Kerala needs to be regarded as part of its resource endowments which must govern the future pattern of its development. The rate of unemployment among this category of labour is now much higher than among the less skilled. Upto now the opportunities for employment available to the relatively educated and skilled labour have been mainly those provided by an expanding governmental bureaucracy and by the educational, health and other such services organized with direct or indirect support from the government; alternatively, such labour has had to migrate outside the State in search of employment. These opportunities are unlikely to be available in the future on the same scale as in the past. Programmes of development that help to absorb such labour — which is itself rapidly increasing as a proportion of the labour force due to expansion of education — would therefore serve more purposes than one.

For the most efficient utilization of the relatively educated and skilled labour it is necessary to develop a network of fairly skill-intensive industries based either on the natural resources of the region or on the basis of intermediate goods which can be expected to be available to the State at sufficiently low prices for these industries to be able to compete with similar industries elsewhere. There are many such industries that are not very capital-intensive and which can be organized in the form of small and medium-scale enterprises.

As wage-rates have risen in Europe and the United States, and labour has shifted to the more capital-intensive industries which could

afford to pay higher wages, the less capital-intensive industries requiring heavy inputs of skilled labour have been migrating in the last two decades to countries like Japan and even Taiwan and Hong Kong. With forward-looking and detailed planning it should be possible to develop them in Kerala in the course of this decade; as wage-rates rise in Japan and other countries where they are now mostly located, and their competitive advantage begins to diminish, the foreign demand for the products of these industries can also be expected to grow rapidly if they are meanwhile developed in Kerala.

Printing and book production is one such industry. It has already some roots in Kerala, but the quality of the output is not good enough for it to be able to grow at the rate at which it can. For improvement of quality it will be necessary to combine some processes which are necessarily skill-intensive but require little capital with other processes which offer relatively little scope for employment and are more capital-intensive. In fact unless the problems posed by choice of technology are viewed in this co-ordinated and comprehensive way — without assuming that labour-intensive and capital-intensive techniques are always necessarily at conflict — it will be impossible to develop the kind of industries which are suited to Kerala's requirements and which should rapidly replace the old type of industries dependent on low-wage, unskilled labour.

Other examples of such industries are electronics, optical and other silica-based industries, industries based on the mineral sands of Kerala such as titanium, phyto-chemicals, industries based on fish and its by-products, timber-based industries catering to the furniture

requirements of the more developed countries, industries linked with tourism, and petro-chemical industries. Careful examination of the technical and economic implications of these industries is however needed before a realistic and well-phased programme of development is worked out. It will also be necessary to set up training programmes and financing institutions suited to the needs of small-scale enterprises in such industries.

It is not possible at this stage to estimate how much additional employment can be generated in the next few years through development programmes in agriculture and industry of the kind indicated above. All that can be said is that such development will generate employment opportunities both directly and indirectly — the latter particularly in the tertiary sector of the economy, and that, since what the unemployed and under-employed seek in the ultimate analysis is not more hours or days of work but higher incomes, increases in the productivity of labour resulting from a broad-based programme of development will indirectly reduce the intensity of the problems now associated with unemployment.

Nevertheless it would be only realistic to proceed on the assumption that it will take some time to make a perceptible impact on the unemployment problem in the State and that some methods will have to be devised meanwhile for providing more employment opportunities to those who belong to the poorest sections of the population. In this connection the experiment about to be started in one of the districts of Kerala for setting up a Labour-cum-Development Bank carries with it the promise of making public works programmes more oriented to the expansion of the productive base of the economy and mobilizing in the

process resources that would otherwise not be available for the purpose.

The proposed Labour-cum-Development Bank is essentially very simple in its conception. It is a credit institution set up to meet the short and medium-term financial requirements of a group of panchayats that are entrusted with the responsibility of devising schemes which would offer employment opportunities for idle labour and at the same time help to increase output and income in the area concerned. The panchayats are required to identify the beneficiaries of each scheme and be responsible for their paying to the Bank in instalments an amount that is considered reasonable in relation to the benefits secured. The labour absorbed in the schemes will be paid wages at the rates prevailing in the area, but it will be required to accept a part of it in the form of 3-year fixed deposits in the Bank carrying a rate of interest of 12½ per cent per annum on the average. Only schemes on which the wage cost is more than two-thirds of the total cost, and in addition meets the above conditions, will be approved and financed by the Bank. The initial financial requirements of the Bank are to be met by loans from the Government (out of the funds available for 'crash employment programmes'), but once a Bank proves its ability to become reasonably self-reliant by choosing the right kind of schemes and recovering from the beneficiaries the amounts due from them these loans would be regarded as part of the Government's contribution to the Bank's share capital; further financial assistance from the Government needs to be made available only to the extent that the Bank's scale of activity requires such assistance and to the extent that the mobilization of idle labour and of savings achieved by it calls for a legitimate degree of subsidy.

The success of this experiment depends essentially on effective and purposive organization at the level of the panchayats for organizing investment and productive activity designed to meet local requirements. Since the population even in the rural areas of Kerala has achieved a high degree of literacy, and is capable of taking an enlightened approach to the problems they face (as has been amply demonstrated in their response to the family planning programmes), there are good chances of the experiment proving to be reasonably successful. The degree of political consciousness and organization which exists in the State at this level is another factor that could contribute to its success. At any time, these are the ways in which experiments need to be conducted for ensuring that public works programmes help to mobilize local resources for meaningful developmental activity and do not deteriorate into wasteful forms of dole distribution organized by an over-burdened and highly centralized bureaucratic machinery.

About 8 or 9 schemes have been identified for this initial experiment of which 4 or 5 are lift irrigation schemes and the rest are schemes for the construction of bunds on the backwaters for prawn culture. It also appears that the popular response to the scheme is quite encouraging. If the experiment shows reasonably good results very much more could be built into it. For instance, instead of paying the deferred component of wages in cash after three years with the interest payments due on it, they could be converted into insurance policies of the kind that appear attractive to poor people. Alternatively, they could be given the choice of receiving the payment in

the form of houses constructed for them. There are now available in the State various techniques of low-cost building that could be drawn upon for this purpose, and which in turn would generate additional demand for local labour and other locally-available resources. (X)

Labour-cum-Development Banks can also be utilized, with adequate support from the Government or other financial institutions, to build up the overheads required for creating agro-industrial market centres all over the State. In a region that is as commercialized as Kerala the development potentialities of such centres — offering facilities for storage of products, supply of credit, fertilizer, and other such inputs, technical consultancy services, and for processing of various kinds — is obvious. Similarly they could be made an important agency for financing the setting up of retail shops organized by panchayats to make available rationed supplies of essential commodities at fixed prices. But, as emphasized earlier, all these possibilities depend on the ability to organize such activity with reasonable competence and efficiency and on public vigilance at the local level to minimize the scope for wastage and corruption. They also depend to a considerable degree on the political leadership being willing to accept and promote the use of democratic institutions for constructive purposes of this kind even while seeking to change the content and direction of social and economic development in the directions they believe in.

(X) See Appendix V.

IV

An important pre-requisite for flexible and constructive planning at the State level is that there should be very much less concentration of decision-making power at the Centre than is the case now. In the earlier stages of planning this was understandable, as there was neither the machinery nor adequate consciousness at the State level for undertaking these tasks. The position has been rapidly changing, and States like Kerala will therefore be considerably handicapped in the planning of its development unless the existing processes of decision-making are significantly modified in line with the new possibilities and requirements.

One of the major constraints on the flexibility of planning at the State level is that imposed by the financial strings now being held by the Centre. Some of this control is of course required for national planning and for achieving other national objectives and cannot possibly be dispensed with. But a large part of the financial control that is now being exercised is traceable to merely the irrationality of policies followed in the past by the Central Government — such as by its giving financial assistance on a large scale in the form of loans on extremely onerous terms irrespective of the purposes for which they are to be used and thereby creating an unnecessary but nonetheless serious debt servicing problem for the States — and more generally to the lack of adequate action in support of the policy of decentralized planning which has been professed by the Planning Commission from time to time.

A complete review of the financial relationships and problems now existing between the Centre and the States is called for as part of the preparatory work on the Fifth Five Year Plan. This is now partly the responsibility of the Finance Commission, but only partly — because there is still much to be done that is not covered by its terms of reference, at least on the basis of interpretations so far placed on the relevant provisions of the Constitution.

## Appendix 1: Growth of Rice Output in Kerala

Kerala has recorded a comparatively high rate of growth in the production of rice, as well as in the productivity of land under this crop, in the course of the last two decades. The relevant data are presented in Table 1.

Table 1: Area, Production and Yield Rate of Rice in Kerala

| Year | Area (000 hectares) | Production (Lakh tonnes) | Yield (Kg/hectares) |
|---|---|---|---|
| 1951-52 | 743.0 | 7.12 | 960 |
| 1952-53 | 742.0 | 7.22 | 973 |
| 1953-54 | 761.0 | 7.51 | 986 |
| 1954-55 | 763.0 | 8.18 | 1072 |
| 1955-56 | 759.0 | 8.84 | 1164 |
| 1956-57 | 762.0 | 8.87 | 1164 |
| 1957-58 | 771.8 | 9.25 | 1207 |
| 1958-59 | 768.4 | 9.54 | 1242 |
| 1959-60 | 768.9 | 10.32 | 1350 |
| 1960-61 | 778.9 | 10.67 | 1371 |
| 1961-62 | 752.7 | 10.04 | 1334 |
| 1962-63 | 800.7 | 10.93 | 1364 |
| 1963-64 | 805.1 | 11.28 | 1401 |
| 1964-65 | 801.1 | 11.21 | 1400 |
| 1965-66 | 802.3 | 9.97 | 1254 |
| 1966-67 | 799.4 | 10.89 | 1366 |
| 1967-68 | 809.5 | 11.24 | 1388 |
| 1968-69 | 873.0 | 12.51 | 1432 |
| 1969-70 | 874.1 | 12.26 | 1403 |
| 1970-71 | 874.8 | 12.98 | 1484 |

Source: P.C.Sahadevan, Rice in Kerala, Department of Agriculture, Government of Kerala, p.15; Indian Agriculture in Brief, 10th and 11th Edition; and Government of Kerala, Kerala Economic Review, 1971.

It will be noticed that the rate of growth recorded between 1952-53 and 1964-65 was particularly high. The performance of Kerala during this period, compared to other States, will be evident from Table 2.

Table 2: Linear Growth Rates of Area, Production and Productivity of Rice during 1952-53 to 1964-65

| State | Percentage of rice production in the State to all India (triennium ending 1964-65) | Linear Growth Rate of | | |
|---|---|---|---|---|
| | | Production % | Area % | Productivity % |
| West Bengal | 14.4 | 1.42 | 0.13 | 1.29 |
| Bihar | 12.8 | 3.63 | 0.23 | 3.36 |
| Andhra Pradesh | 11.5 | 5.15 | 3.19 | 1.56 |
| Orissa | 11.5 | 2.88 | 1.14 | 1.60 |
| Madras | 11.0 | 6.04 | 3.19 | 2.19 |
| Uttar Pradesh | 9.0 | 5.08 | 1.97 | 2.61 |
| Madhya Pradesh | 8.5 | 2.34 | 1.28 | 0.93 |
| Assam | 4.9 | 0.78 | 1.32 | 0.47 |
| Mysore | 4.1 | 5.96 | 1.97 | 3.33 |
| Maharashtra | 3.8 | 3.38 | 1.75 | 1.41 |
| Kerala | 3.1 | 4.42 | 0.53 | 3.70 |
| Panjab | 1.5 | 12.31 | 9.21 | 1.80 |
| Himachal Pradesh | 0.1 | 4.61 | 0.29 | 4.18 |

Source: Ministry of Food and Agriculture, Growth Rates in Agriculture 1949-50 to 1964-65, Government of India, 1968.

The linear growth rate of rice production between 1952-53 and 1964-65 in Kerala was in fact one of the highest in the country, in spite of the fact that the growth rate of the area under rice in Kerala was one of the lowest. Increase in productivity accounted for the bulk of the increase in production. The linear growth rate of productivity of rice in the State, viz., 3.70 per cent per annum, was therefore also one of the very highest among all the States in India. If the period 1951-71 is taken into account the linear growth rates of area, production and productivity of rice in Kerala work out to 0.90 per cent, 3.68 per cent, and 2.60 per cent respectively per annum.

Further analysis of the data shows however considerable differences in the rates of growth as between the 'fifties and the 'sixties.

Table 3

| Period | Production | Area | Productivity | |
|---|---|---|---|---|
| 1950-51 to 1970-71 | 3.68 | 0.90 | 2.60 | (Linear) |
| 1950-51 to 1970-71 (Excluding 1965-66) | 4.30 | .. | 2.91 | " |
| 1950-51 to 1959-60 | 5.10 | 0.51 | 5.04 | " |
| 1960-61 to 1970-71 | 2.12 | 1.55 | 0.65 | " |

It will be observed that the yearly growth rates of production and productivity for the entire period 1950-51 to 1970-71 (with or without 1965-66) are very much lower than for the first decade 1950-60. While the greater part of the growth of production in the 'fifties was attributable to the growth of productivity rather than to extension of area, the reverse is true of the 'sixties when the annual growth rate of area exceeded the growth rate in productivity. That the growth rates of output and of the productivity of land under rice in the 'sixties have been lower than in the 'fifties is significant. The decline in the rate of increase in the productivity of land since the middle of the 'sixties, is even more remarkable since the New Agricultural Strategy embodied in the I.A.D.P., I.A.A.P., Small Farmers Development Programme, etc., was implemented in the subsequent period and the new high-yielding varieties of seeds were also introduced during this period.

The data presented above could give the impression that the Green Revolution has made no impact whatsoever on rice cultivation in the State. This is not wholly true. Though the bulk of the crop

in the State has remained outside the mainstream of the Green Revolution, a small segment of it — namely the Punja or Summer crop — has shown significant increases in yield in recent years.*

Table 4: Average Yield of Virippu, Mundakan and Punja Paddy

| Year | Virippu | Mundakan | Punja |
|---|---|---|---|
| 1958-59 | 1733 | 2025 | 2190 |
| 1959-60 | 1900 | 2220 | 2184 |
| 1960-61 | 1921 | 2218 | 2406 |
| 1961-62 | 1474 | 2253 | 2481 |
| 1962-63 | 1901 | 2227 | 2301 |
| 1963-64 | 1975 | 2296 | 2273 |
| 1964-65 | 1876 | 2327 | 2317 |
| 1965-66 | 2000 | 1808 | 1733 |
| 1966-67 | 1920 | 2187 | 2230 |
| 1967-68 | 1972 | 2168 | 2377 |
| 1968-69 | 1949 | 2222 | 2453 |
| 1969-70 | 1986 | 2065 | 2767 |
| 1958-59 to 1970-71 | 1925 | 2168 | 2299 |

Source: State Planning Board, Fact Book on Agriculture, 1969; Bureau of Economics and Statistics, Reports on Crop-Cutting Surveys, and Season and Crop Reports for Kerala State.

It will be noticed that of the three seasons in which rice is grown, Punja has recorded the highest yield as well as the highest rate of increase of yield. In the 'sixties, while Virippu crop registered a yield increase of only 86 Kg. per hectare and Mundakan crop suffered a set back of 135 Kg. per hectare, the Punja crop improved its average

* There are three main paddy seasons in Kerala: the Virippu, Mundakan, and Punja. The Virippu crop is sown during April-June and harvested in August-October. The sowing and harvesting periods of Mundakan are August-October and December-January. The Punja crop sown in November-December is harvested in February-March and that sown in January-March matures in April-May. The three crops. Virippu, Mundakan and Punja broadly correspond to the Autumn, Winter and Summer paddy.

yield by 533 Kg. per hectare. Further, during the latter half of the decade, the Virippu and Mundakan did not register any increase in yield; their peak yields in the second half of the decade were lower than their peak yields in the first half. As against this, the Punja crop registered a substantial steady rise in yield in the second half of the 'sixties.

The Punja crop has several environmental factors in its favour. During the Punja season, the temperature is high, the sky is clear, there is adequate sunlight, and relative humidity is low. The risk element in the Punja crop is comparatively low and the cultivators are therefore prepared to experiment with new inputs and new techniques. As against this, the Virippu and Mundakan crops face adverse environmental conditions: cloudy weather, low temperature, high relative humidity, water-logging caused by excess rain and inadequate drainage facilities and heavy incidence of pest and diseases. All of them highten the risk element, which acts as a deterrent to the adoption of the more expensive techniques and inputs. Thus, as of 1970-71, 53.98 per cent of the Punja fields were sown to high-yielding varieties of seeds as against only 12.62 per cent of the Mundakan area and 14.72 per cent of the Virippu area. The new varieties of paddy are more prone to the attack of pests and diseases than traditional strains, and more so in the Virippu and Mundakan seasons than during the Punja season. The risk element on this account is therefore greater during the Virippu and Mundakan seasons. The H.Y.V. involves higher cost of cultivation by way of fertilizers, insecticides, etc. The proportion of area using chemical fertilizers came to 94.43 per cent in the case

of Punja, as against 71.44 per cent in Mundakan and 46.12 per cent in Viri ppu paddy.

The Punja crop, however, accounts for only a small proportion of the total area under paddy in the State. As of 1969-70, 45 per cent of the area was under Virippu, 44 per cent under Mundakan and only 11 per cent under Punja. Given the definite advantage of the Punja season and the environmental handicaps of the other two seasons, it would seem that the prospects of a break-through in productivity lay in expansion of the area under this summer crop. But this has not happened; in recent years, the area under Mundakan crop has increased at the expense of Virippu crop, but the area under Punja has remained more or less constant.

Table 5: Distribution of Area Under Paddy Between Three Seasons

(area in hectares)

| District | Virippu | Mundakan | Punja | Total |
|---|---|---|---|---|
| Trivandrum | 18462 | 20201 | 826 | 39489 |
| Quilon | 21324 | 29340 | 1220 | 51584 |
| Alleppey | 20554 | 22982 | 41704 | 85240 |
| Kottayam | 7898 | 24679 | 17504 | 50081 |
| Ernakulam | 40993 | 42394 | 10304 | 93691 |
| Trichur | 38494 | 61499 | 13318 | 113311 |
| Kozhikode | 63320 | 61909 | 5155 | 130384 |
| Cannanore | 65897 | 29705 | 3051 | 98653 |
| State | 393747 | 382171 | 98141 | 874059 |

Source: State Planning Board and Bureau of Economics and Statistics, Statistics for Planning, Serial No.1, Agriculture, Government of Kerala, 1972, p.33.

The Punja crop is mainly concentrated in the four districts of Alleppey, Kottayam, Ernakulam and Trichur. Alleppey district alone

accounts for 42.5 per cent of the total area under Punja; the share of Kottayam, Ernakulam and Trichur districts works out to 17.8 per cent, 10.5 per cent and 13.5 per cent respectively. In the remaining districts, the area under the Punja crop forms negligible proportions.

Why is it that, despite the proven advantage of the Punja season, the area under Punja crop has remained so low? Lack of controlled supplies of water seems to be the main constraint on the expansion of area under Punja. Punja paddy is a dry season crop and is grown only in such areas as have assured supply of water during the dry season. In Alleppey, Kottayam, Ernakulam (and to a large extent in Trichur) districts the punja crop is irrigated with water from adjoining lakes, backwaters and rivers. In fact it is these natural sources of water rather than man-made irrigation facilities that are the main-stay of the Punja crop in the leading Punja areas, viz., Alleppey, Kottayam, and Ernakulam, which together account for over 70 per cent of the Punja crop. These districts cannot boast of any major irrigation project, except the Periyar Valley Scheme started during the Third Plan period. On the other hand, most of the major irrigation schemes of the State like Malampuzha, Walayar, Vazhani, Pothundy, Mangalam, etc. are located in Palghat district. Trichur district has also a few major irrigation schemes such as Peechi and Chalakudi.

In fact, the irrigation projects undertaken in the State have not altered in any significant way the seasonal pattern of rice production in the State. But then, as mentioned above, most of the major irrigation projects undertaken in the State were concentrated in the Palghat district. In this district inter-seasonal differences are less

pronounced. Thanks to a dry and hot weather, low relative humidity, fewer rainy days, etc. the Virippu and Mundakan crops here face less environmental hazards than in the other districts. Thus, the yield rates of these two crops in Palghat have been higher than elsewhere in the State; the average yields have also been rising over time. Under the circumstances, presumably there was no reason for a change in the cropping season; as of 1969-70, despite the increase in irrigation facilities, the Virippu and Mundakan crops accounted for 97.6 per cent of the total paddy area in Palghat. But the Punja crop in Palghat yielded a record crop in 1969-70, viz., 3160 Kg per hectare, the highest ever recorded in any district in the State. It is, therefore, a matter for investigation whether lack of adequate irrigation in summer is the constraint on the expansion of Punja area in Palghat district.

At the same time, concerted efforts for rescuing the Virippu and Mundakan crops from the environmental constraints are called for. Some of the facts like temperature, sunlight, humidity, etc. may be beyond human control; but others like floods, water-logging, and incidence of pests are remediable. Therefore, a package of measures for flood control, drainage, and controlled supplies of water when needed has to be conceived and implemented.

Given below are the amounts borrowed by the State Government by way of 'Miscellaneous Development Loans', and the repayments due on them from the Centre, in each of the years from 1957-58 to 1968-69:

| Year | Receipts (Rs. crores) | Repayments (Rs. crores) |
|---|---|---|
| 1957-58 | 4.50 | - |
| 1958-59 | 4.50 | - |
| 1959-60 | 3.77 | - |
| 1960-61 | 6.14 | - |
| 1961-62 | 6.46 | 0.59 |
| 1962-63 | 12.38 | 1.18 |
| 1963-64 | 13.22 | 3.32 |
| 1964-65 | 19.48 | 3.84 |
| 1965-66 | 31.29 | 5.04 |
| 1966-67 | 17.75 | 6.86 |
| 1967-68 | 12.78 | 8.52 |
| 1968-69 | 6.37 | 14.00 |

The 'Block Loans' that have been extended by the Centre since 1968-69 carry somewhat less onerous terms — they are repayable in 15 annual instalments (though starting from the first year itself) and the interest rate is only 5 per cent per annum — but there is still little relationship between the terms of loan assistance and the nature of the projects for which such financial assistance is given. The resulting financial pressures on the State budget are extremely serious and are likely to come in the way of more rational planning in the future.

## Appendix 3: A Note on Optimal Land Utilization through Multiple Cropping

There are three important characteristics of agricultural land which need to be kept in mind while allocating this natural resource. The aggregate supply of land is generally inelastic at any time while it need not be so for any particular crop.• Second, the quality of land varies due to variations in soil and climatic conditions as well as in the availability of sources of water supply. Though some of the deficiencies can be corrected the quality of land does impose certain technical constraints on the use to which it can be put. Third, the same piece of land can generally be used for growing different crops, either together or in rotation; this makes it possible not only to utilize land intensively but, through careful choice of the crop-mix, to make up in varying degrees for the handicaps imposed by soil, climate and availability of water.

The high rate of growth of population over several decades and the limited growth in the area under cultivation have led to a situation where the land-man ratio is lower in Kerala than in any other State in India. Moreover, since land is unequally distributed, the average size of holdings is — as will be evident from the table below — less than 1 acre for 60 per cent of the operational holdings in the State.

| Deciles (from top to bottom) | Total area operated (in million acres) | Percentage of area operated | Average size of operational holding (in acres) |
|---|---|---|---|
| Top 5 per cent | 1.71 | 37.9 | 13.81 |
| First decile | 2.36 | 52.2 | 9.51 |
| Second " | 0.75 | 10.7 | 3.04 |
| Third " | 0.47 | 10.3 | 1.86 |
| Fourth " | 0.31 | 6.9 | 1.26 |
| Fifth " | 0.22 | 4.8 | 0.87 |
| Sixth " | 0.16 | 3.5 | 0.64 |
| Seventh " | 0.11 | 2.4 | 0.44 |
| Eighth " | 0.08 | 1.7 | 0.31 |
| Ninth " | 0.05 | 1.1 | 0.20 |
| Tenth " | 0.02 | 0.4 | 0.07 |
| All operational holdings | 4.52 | 100.0 | 1.82 |

Source: Survey on Land Reforms in Kerala, 1966-67, Report, Bureau of Economics and Statistics, Government of Kerala (unpublished but available in mimeographed form). This study, based on a sample survey covering 3475 households in the State, contains a very comprehensive account of the structure of land-holdings in each District and is among the best sources of data available in India for analysing the problems associated with distribution of land and with land reforms.

The intensity of use of land is usually also influenced by the nature and extent of the rights which its occupants (i.e. operators) have over it. In Kerala ownership of land has been highly concentrated and consequently the scale of tenancy has also been very high. In fact even as late as 1966-67, only about 1.5 million of the 2.8 million agrarian households in the State owned any land at all; and, of the 3.4 million acres owned by these households, 60 per cent belonged to one-tenth of them. The total area under operational holdings was about 4.5 million acres — since, in addition to the land owned by private households, there was also considerable land belonging to temples, royal families, companies, and other institutions (apart from land

under government management) which were generally leased out to tenants. The area under tenancy was in all a little over 1.9 million acres out of the total operated area of 4.5 million acres.

For a variety of reasons — mainly connected with the earlier evolution of land tenures in Kerala[1] — ownership has been very much more concentrated in the northern districts of the State than in the districts in the south covering broadly the territory of the earlier State of Travancore. Correspondingly the area leased in as a percentage of the total operated area has been also generally much higher in the northern districts. However, even with tenancy on an extensive scale, land holding remained highly concentrated in all parts of the State (as will be evident from the data below relating to 1966-67).[2]

| District | Concentration ratio in the ownership holdings | Total area leased-in as percentage of total area operated | Concentration ratio in the operational holdings |
|---|---|---|---|
| Cannanore | 0.82 | 44.3 | 0.66 |
| Kozhikode | 0.75 | 80.2 | 0.52 |
| Palghat | 0.80 | 67.8 | 0.66 |
| Trichur | 0.71 | 75.3 | 0.69 |
| Ernakulam | 0.66 | 38.6 | 0.64 |
| Kottayam | 0.63 | 30.7 | 0.67 |
| Alleppey | 0.59 | 15.8 | 0.60 |
| Quilon | 0.56 | 1.6 | 0.56 |
| Trivandrum | 0.55 | 2.6 | 0.55 |

The problem of tenancy has been sought to be tackled recently by legislation providing for vesting in the Government all rights, titles and interests of land-owners and intermediaries — free from encumbrances - in holdings which are in the possession of cultivating tenants. This law has come into effect from January 1970. Though there are still

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1 T.C.Varghese, Agrarian Change and Economic Consequences: Land Tenures in Kerala, 1850-1950 (Allied Publishers, 1970), Chapters IV-VII.

2 Survey on Land Reforms, op.cit.

many problems to be overcome in assigning the landlords' and intermediaries' rights in the cultivating tenants — mainly for lack of records of tenancies and the consequent difficulty in identifying the cultivating tenant in respect of each holding — one might assume that tenancy will cease to be a widespread phenomenon in Kerala in a few years' time.

Another part of the land reform programme is to impose ceilings on land holdings and distribute the surpluses to those with little or no land. The ceiling fixed in 1963 on a family of not more than five members was 12 standard acres, with provision for one additional standard acre for each member of the family in excess of five, subject to a maximum of 20 standard acres in all for a family. On this basis, the estimated surplus land available in the State was only 0.12 million acres (of which surplus nearly nine-tenth was in the three districts of Cannanore, Kozhikode and Palghat in the northern part of the State).[3] Even this surplus — according to the Land Reforms Survey conducted in 1966-67 — would have been difficult to locate, as there was no record of either the rights on land possessed by all families or of the number of unmarried adult persons in every household. The ceiling has since then been lowered, but this problem remains. It also seems probable that due to further partitions, sales, transfers, etc. in the intervening period the surplus lands available have themselves become smaller.[4]

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3 Land Reforms Survey, Chapter XII, op.cit.

4 "When the Communist Party came into power in Kerala in 1957, big landlords rightly apprehended that their feudal interests on land would be at stake. This fear paved the way for large scale land transfers in the State even before the Agrarian Relations Act of 19[illegible] was adumbrated. The passing of the Agrarian Relations Act in 1960 and the Kerala Land Reforms Act in 1963 also prompted some hectic sales and transfers around those years". Cf. Land Reforms Survey, op.cit., Chapter X.

Moreover, even in the areas in which surpluses can be found, a good part of the land so distributable might be already in smaller operational holdings on account of the extensive scale of tenancy prevalent in these areas. Measures of land reform will, in course of time, confer ownership rights on those who are now tenants and thus reduce the inequalities in the distribution of income originating in agriculture. The size distribution of operational holdings is however not likely to become very different from what it is now — at any rate in the lower ranges. We should expect around 60 per cent of these holdings to be below 1 acre in size — more than half of them to be below ½ acre — and only about one-fifth of the operational holdings to be over 2 acres in size.

If there is to be a significant and reasonably adequate increase in incomes in the lower strata it is therefore necessary to explore the scope for raising the productivity of land in the smaller holdings. Rural households in the State depend very considerably on sources of income other than cultivation of land.[5] Though this might have to continue, the problems of unemployment and under-employment and of rural poverty in general would become less acute if higher incomes can be secured in small-sized holdings through more intensive use of land.

The physical configuration of the State has already made possible the growth and development of a diversified cropping pattern. In the

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5 According to the data collected through the All India Rural Debt and Investment Survey, 1961-62, the average value of gross produce per cultivator household in Kerala was only Rs.586 during the year; the average value of the net receipts per cultivator household from industry, trade, transport, miscellaneous professions and services, and salaries and wages amounted however to Rs.655, and "other miscellaneous receipts" (including remittances from migrants) to another Rs.144. In the case of non-cultivator households (in the rural areas), the amounts accruing from these three sources were Rs.0.4, Rs.681 and Rs.92 respectively.

high-land region, where the annual rainfall ranges between 100 and 2 inches, are located the reserve forests of the State; but it also produces tea, cardamom, pepper, rubber, ginger and turmeric on an extensive scale. In the mid-land region, where the annual rainfall ranges from 50 to 150 inches, are grown paddy, banana, arecanut, jack fruit, mango, cashew and a large variety of other agricultural produ The low-land is narrow, irregular in shape, and consists mainly of recent deposits of sand and alluvium; but it is in this region where most of the coconuts are grown. What needs to be considered is whet through inter-cropping in each of these regions — where it already exists but could possibly be improved upon — the yield per acre can significantly increased.

Prima facie, the scope for increasing the yield per acre seems be considerable. For instance, the average yield per coconut palm (which is now less than 30 nuts per annum in the State) can be doubl fairly easily with the varieties now known. It requires, among othe things, wider spacing between the palms. The average yield per palm can be further increased if the spacing between the trees is made st wider. Though the optimal distance between any two coconut palms appears to be 22 feet if only coconuts are being grown and the objec is to maximize the output of nuts per acre,[6] wider spacing would per

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[6] "Where the palms are over-croded they grow tall and lanky and fai to give satisfactory yield due to the intense competition between palms for nutrients, moisture, light or air. In India the general recommendation is a spacing of 7½ to 9 metres for the ordinary t palms". The effect of spacing on the yield per palm and on the t yield per acre is evident from the results of some experiments do in Jamaica:

| Spacing (sq.feet) | Palms per acre (number) | Average number of nuts per palm | Average numbe of nuts per a |
|---|---|---|---|
| 22 | 90 | 53.5 | 4815 |
| 25 | 69 | 68.1 | 4699 |
| 30 | 48 | 91.4 | 4387 |
| 35 | 35 | 95.1 | 3329 |

Cf. P.K.Thampan, Coconut Culture in India (1972), Chapter 4.

other crops (such as cocoa) being grown in some areas of the State and higher income being secured from the crop-mix.[7] There are many crops that be considered in this context — for being grown in rotation or at the same time — such as cloves, cinnamon, silk cotton, pineapples, lemongrass, sweet potato, soya beans, and tapicca.

The first step to be taken for exploring these possibilities is to collect all the relevant information in respect of the alternatives available. For each type of soil and climate there will be many alternatives depending, among other things, on the conditions of availability of water. Some crops will however take longer to mature than others; some will require more costly inputs but might yield higher revenue; the yield from some might be more uncertain than from others; and, moreover, there might be both complementary and competing relationships between different crops. The optimal crop-mix will have to be worked out for each type of holding taking into account all these factors.

The basic studies on the utilisation of agricultural land and of cropping patterns by applying linear programming techniques have been made by Henderson and Day.[8] The Henderson-Day models are however too

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7 See, for instance, Cocoa and Coconuts in Malaya (Proceeding of a Symposium held in Kuala Lumpur in September, 1967), edited by J.W. Blencoe and P.D. Turner.

8 James M.Henderson, "The Utilisation of Agricultural Land: A Theoretical and Empirical Enquiry", The Review of Economics and Statistics, Vol. XLI, August 1959, pp. 242-259.

Richard H.Day, Recursive Programming and Production Response, North Holland Publishing Company, 1963.

inadequate to provide satisfactory solutions to the utilization of agricultural land in Kerala. In the first place, the Henderson model is essentially a short-run model and though Day has dynamised the model by incorporating time derivatives, it will not still be able to deal with the problems of Kerala's cropping patterns. In the Kerala situation the complications arise due to inter-cropping with the perennial crops. Further, quite a few of the agricultural produc grown in the State earn foreign exchange for which an appropriate value has to be imputed.

The solutions obtained to the problem of optimal utilisation of land might indicate reallocation of land among the different crops say, as between perennial crops and seasonal crops, or a change in the crop-mix among the perennial crops themselves. The optimal utilisation of the garden lands might necessitate a more scientific spacing between perennial trees like coconut — thereby reducing the number of trees per unit of area — and, as a part of this change, replantation of coconut gardens with either the same varieties as no or new varieties.

Replantation of perennial trees, such as coconuts, would involve — among other things — loss of income in the period between the cutting down of the existing trees and maturing of the new ones. Households with small holdings might not be able to afford such loss of income. The extent of the loss can be reduced by suitable inter-cropping, such as by combining tapioca cultivation with coconut growing in the initial stages. Nevertheless, the possibility of som net loss for a period has to be reckoned with.

Replantation schemes are generally supported by subsidies, as in the case of rubber. While there may be a case for such subsidy the extent of dependence on subsidy needs to be minimized. As indicated above, this can be done in part by introducing the time dimension at the programming stage and evolving crop-mixes which ensure reasonably high levels of income from the beginning even if some of the crops involved have along gestation period. Once the optimal crop-mix has been determined, what is more important is that adequate short and medium-term credit is made available to facilitate and support the necessary shift in the cropping pattern. A credit-plan will have to be, therefore, an essential counterpart of the production-plan based on the crop-mix considered optimal to any given set of circumstances.

## Appendix : 1 Growth of Rice Output in Kerala

Kerala has recorded a comparatively high rate of growth in the production of rice, as well as in the productivity of land under this crop, in the course of the last two decades. The relevant data are presented in Table 1.

Table 1: Area, Production and Yield Rate of Rice in Kerala

| Year | Area (000 hectares) | Production (Lakh tonnes) | Yield (Kg/hectares) |
|---|---|---|---|
| 1951-52 | 743.0 | 7.12 | 960 |
| 1952-53 | 742.0 | 7.22 | 973 |
| 1953-54 | 761.0 | 7.51 | 986 |
| 1954-55 | 763.0 | 8.18 | 1072 |
| 1955-56 | 759.0 | 8.84 | 1164 |
| 1956-57 | 762.0 | 8.87 | 1164 |
| 1957-58 | 771.8 | 9.25 | 1207 |
| 1958-59 | 768.4 | 9.54 | 1242 |
| 1959-60 | 768.9 | 10.32 | 1350 |
| 1960-61 | 778.9 | 10.67 | 1371 |
| 1961-62 | 752.7 | 10.04 | 1334 |
| 1962-63 | 800.7 | 10.93 | 1364 |
| 1963-64 | 805.1 | 11.28 | 1401 |
| 1964-65 | 801.1 | 11.21 | 1400 |
| 1965-66 | 802.3 | 9.97 | 1254 |
| 1966-67 | 799.4 | 10.89 | 1366 |
| 1967-68 | 809.5 | 11.24 | 1388 |
| 1968-69 | 873.0 | 12.51 | 1432 |
| 1969-70 | 874.1 | 12.26 | 1403 |
| 1970-71 | 874.8 | 12.98 | 1484 |

Source: P.C.Sahadevan, Rice in Kerala, Department of Agriculture, Government of Kerala, p.15; Indian Agriculture in Brief, 10th and 11th Edition; and Government of Kerala, Kerala Economic Review, 1971.

It will be noticed that the rate of growth recorded between 1952-53 and 1964-65 was particularly high. The performance of Kerala during this period, compared to other States, will be evident from Table 2.

Table 2: Linear Growth Rates of Area, Production and Productivity of Rice during 1952-53 to 1964-65

| State | Percentage of rice production in the State to all India (triennium ending 1964-65) | Linear Growth Rate of | | |
|---|---|---|---|---|
| | | Production % | Area % | Productivity % |
| West Bengal | 14.4 | 1.42 | 0.13 | 1.29 |
| Bihar | 12.8 | 3.63 | 0.23 | 3.36 |
| Andhra Pradesh | 11.5 | 5.15 | 3.19 | 1.56 |
| Orissa | 11.5 | 2.88 | 1.14 | 1.60 |
| Madras | 11.0 | 6.04 | 3.19 | 2.19 |
| Uttar Pradesh | 9.0 | 5.08 | 1.97 | 2.61 |
| Madhya Pradesh | 8.5 | 2.34 | 1.28 | 0.93 |
| Assam | 4.9 | 0.78 | 1.32 | 0.47 |
| Mysore | 4.1 | 5.96 | 1.97 | 3.33 |
| Maharashtra | 3.8 | 3.38 | 1.75 | 1.41 |
| Kerala | 3.1 | 4.42 | 0.53 | 3.70 |
| Panjab | 1.5 | 12.31 | 9.21 | 1.80 |
| Himachal Pradesh | 0.1 | 4.61 | 0.29 | 4.18 |

Source: Ministry of Food and Agriculture, Growth Rates in Agriculture 1949-50 to 1964-65, Government of India, 1968.

The linear growth rate of rice production between 1952-53 and 1964-65 in Kerala was in fact one of the highest in the country, in spite of the fact that the growth rate of the area under rice in Kerala was one of the lowest. Increase in productivity accounted for the bulk of the increase in production. The linear growth rate of productivity of rice in the State, viz., 3.70 per cent per annum, was therefore also one of the very highest among all the States in India. If the period 1951-71 is taken into account the linear growth rates of area, production and productivity of rice in Kerala work out to 0.90 per cent, 3.68 per cent, and 2.60 per cent respectively per annum.

Further analysis of the data shows however considerable differences in the rates of growth as between the 'fifties and the 'sixties.

Table 3

| Period | Production | Area | Productivity | |
|---|---|---|---|---|
| 1950-51 to 1970-71 | 3.68 | 0.90 | 2.60 | (Linear) |
| 1950-51 to 1970-71 (Excluding 1965-66) | 4.30 | .. | 2.91 | " |
| 1950-51 to 1959-60 | 5.10 | 0.51 | 5.04 | " |
| 1960-61 to 1970-71 | 2.12 | 1.55 | 0.65 | " |

It will be observed that the yearly growth rates of production and productivity for the entire period 1950-51 to 1970-71 (with or without 1965-66) are very much lower than for the first decade 1950-60. While the greater part of the growth of production in the 'fifties was attributable to the growth of productivity rather than to extension of area, the reverse is true of the 'sixties when the annual growth rate of area exceeded the growth rate in productivity. That the growth rates of output and of the productivity of land under rice in the 'sixties have been lower than in the 'fifties is significant. The decline in the rate of increase in the productivity of land since the middle of the 'sixties, is even more remarkable since the New Agricultural Strategy embodied in the I.A.D.P., I.A.A.P., Small Farmers Development Programme, etc., was implemented in the subsequent period and the new high-yielding varieties of seeds were also introduced during this period.

The data presented above could give the impression that the Green Revolution has made no impact whatsoever on rice cultivation in the State. This is not wholly true. Though the bulk of the crop

in the State has remained outside the mainstream of the Green Revolution, a small segment of it — namely the Punja or Summer crop — has shown significant increases in yield in recent years.*

Table 4: Average Yield of Virippu, Mundakan and Punja Paddy

| Year | Virippu | Mundakan | Punja |
|---|---|---|---|
| 1958-59 | 1733 | 2025 | 2190 |
| 1959-60 | 1900 | 2220 | 2184 |
| 1960-61 | 1921 | 2218 | 2406 |
| 1961-62 | 1474 | 2253 | 2481 |
| 1962-63 | 1901 | 2227 | 2301 |
| 1963-64 | 1975 | 2296 | 2273 |
| 1964-65 | 1876 | 2327 | 2317 |
| 1965-66 | 2000 | 1808 | 1733 |
| 1966-67 | 1920 | 2187 | 2230 |
| 1967-68 | 1972 | 2168 | 2377 |
| 1968-69 | 1949 | 2222 | 2453 |
| 1969-70 | 1986 | 2065 | 2767 |
| 1958-59 to 1970-71 | 1925 | 2168 | 2299 |

Source: State Planning Board, Fact Book on Agriculture, 1969; Bureau of Economics and Statistics, Reports on Crop-Cutting Surveys, and Season and Crop Reports for Kerala State.

It will be noticed that of the three seasons in which rice is grown, Punja has recorded the highest yield as well as the highest rate of increase of yield. In the 'sixties, while Virippu crop registered a yield increase of only 86 Kg. per hectare and Mundakan crop suffered a set back of 135 Kg. per hectare, the Punja crop improved its average

* There are three main paddy seasons in Kerala: the Virippu, Mundakan and Punja. The Virippu crop is sown during April-June and harvested in August-October. The sowing and harvesting periods of Mundakan are August-October and December-January. The Punja crop sown in November-December is harvested in February-March and that sown in January-March matures in April-May. The three crops. Virippu, Mundakan and Punja broadly correspond to the Autumn, Winter and Summer paddy.

yield by 533 Kg. per hectare. Further, during the latter half of the decade, the Virippu and Mundakan did not register any increase in yield; their peak yields in the second half of the decade were lower than their peak yields in the first half. As against this, the Punja crop registered a substantial steady rise in yield in the second half of the 'sixties.

The Punja crop has several environmental factors in its favour. During the Punja season, the temperature is high, the sky is clear, there is adequate sunlight, and relative humidity is low. The risk element in the Punja crop is comparatively low and the cultivators are therefore prepared to experiment with new inputs and new techniques. As against this, the Virippu and Mundakan crops face adverse environmental conditions: cloudy weather, low temperature, high relative humidity, water-logging caused by excess rain and inadequate drainage facilities and heavy incidence of pest and diseases. All of them heighten the risk element, which acts as a deterrent to the adoption of the more expensive techniques and inputs. Thus, as of 1970-71, 53.98 per cent of the Punja fields were sown to high-yielding varieties of seeds as against only 12.62 per cent of the Mundakan area and 14.72 per cent of the Virippu area. The new varieties of paddy are more prone to the attack of pests and diseases than traditional strains, and more so in the Virippu and Mundakan seasons than during the Punja season. The risk element on this account is therefore greater during the Virippu and Mundakan seasons. The H.Y.V. involves higher cost of cultivation by way of fertilizers, insecticides, etc. The proportion of area using chemical fertilizers came to 94.43 per cent in the case

of Punja, as against 71.44 per cent in Mundakan and 46.12 per cent in Virippu paddy.

The Punja crop, however, accounts for only a small proportion of the total area under paddy in the State. As of 1969-70, 45 per cent of the area was under Virippu, 44 per cent under Mundakan and only 11 per cent under Punja. Given the definite advantage of the Punja season and the environmental handicaps of the other two seasons, it would seem that the prospects of a break-through in productivity lay in expansion of the area under this summer crop. But this has not happened; in recent years, the area under Mundakan crop has increased at the expense of Virippu crop, but the area under Punja has remained more or less constant.

Table 5: Distribution of Area Under Paddy Between Three Seasons

(area in hectares)

| District | Virippu | Mundakan | Punja | Total |
|---|---|---|---|---|
| Trivandrum | 18462 | 20201 | 826 | 39489 |
| Quilon | 21324 | 29340 | 1220 | 51584 |
| Alleppey | 20554 | 22982 | 41704 | 85240 |
| Kottayam | 7898 | 24679 | 17504 | 50081 |
| Ernakulam | 40993 | 42394 | 10304 | 93691 |
| Trichur | 38494 | 61499 | 13318 | 113311 |
| Kozhikode | 63320 | 61909 | 5155 | 130384 |
| Cannanore | 65897 | 29705 | 3051 | 98653 |
| State | 393747 | 382171 | 98141 | 874059 |

Source: State Planning Board and Bureau of Economics and Statistics, Statistics for Planning, Serial No.1, Agriculture, Government of Kerala, 1972, p.33.

The Punja crop is mainly concentrated in the four districts of Alleppey, Kottayam, Ernakulam and Trichur. Alleppey district alone

accounts for 42.5 per cent of the total area under Punja; the share of Kottayam, Ernakulam and Trichur districts works out to 17.8 per cent, 10.5 per cent and 13.5 per cent respectively. In the remaining districts, the area under the Punja crop forms negligible proportions.

Why is it that, despite the proven advantage of the Punja season, the area under Punja crop has remained so low? Lack of controlled supplies of water seems to be the main constraint on the expansion of area under Punja. Punja paddy is a dry season crop and is grown only in such areas as have assured supply of water during the dry season. In Alleppey, Kottayam, Ernakulam (and to a large extent in Trichur) districts the punja crop is irrigated with water from adjoining lakes, backwaters and rivers. In fact it is these natural sources of water rather than man-made irrigation facilities that are the main-stay of the Punja crop in the leading Punja areas, viz., Alleppey, Kottayam, and Ernakulam, which together account for over 70 per cent of the Punja crop. These districts cannot boast of any major irrigation project, except the Periyar Valley Scheme started during the Third Plan period. On the other hand, most of the major irrigation schemes of the State like Malampuzha, Walayar, Vazhani, Pothundy, Mangalam, etc. are located in Palghat district. Trichur district has also a few major irrigation schemes such as Peechi and Chalakudi.

In fact, the irrigation projects undertaken in the State have not altered in any significant way the seasonal pattern of rice production in the State. But then, as mentioned above, most of the major irrigation projects undertaken in the State were concentrated in the Palghat district. In this district inter-seasonal differences are less

pronounced. Thanks to a dry and hot weather, low relative humidity, fewer rainy days, etc. the Virippu and Mundakan crops here face less environmental hazards than in the other districts. Thus, the yield rates of these two crops in Palghat have been higher than elsewhere in the State; the average yields have also been rising over time. Under the circumstances, presumably there was no reason for a change in the cropping season; as of 1969-70, despite the increase in irrigation facilities, the Virippu and Mundakan crops accounted for 97.6 per cent of the total paddy area in Palghat. But the Punja crop in Palghat yielded a record crop in 1969-70, viz., 3160 Kg per hectare, the highest ever recorded in any district in the State. It is, therefore, a matter for investigation whether lack of adequate irrigation in summer is the constraint on the expansion of Punja area in Palghat district.

At the same time, concerted efforts for rescuing the Virippu and Mundakan crops from the environmental constraints are called for. Some of the facts like temperature, sunlight, humidity, etc. may be beyond human control; but others like floods, water-logging, and incidence of pests are remediable. Therefore, a package of measures for flood control, drainage, and controlled supplies of water when needed has to be conceived and implemented.

P.G.K.Panikar

## Appendix II: Cost Escalations on Projects and the Terms of Loan Assistance from the Central Government

A major defect of planning at the State level has been in taking up at the same time too many projects requiring financial resources far in excess of the amounts that could be expected to be forthcoming. As a result, the execution of most of the projects gets considerably slowed down; costs rise due to the general rise in prices and the interest chargeable on the loans taken; and resources get tied up wastefully in several projects without any of them showing results as quickly as they could otherwise.

For instance, there are now 7 irrigation projects in different stages of execution. The total cost of these projects is about Rs.115 crores; but the provision for them in the Fourth Plan period as a whole was only Rs.26 crores, and the annual provision now being made is only around Rs.5 crores. As will be evident from the table below, their revised cost estimates are on the average about three times as high as in the original project reports; at the rate of implementation so far it might take several years more to complete them and the costs can therefore be expected to rise very much more.

| Name of Irrigation project | Original estimate of cost | Revised estimate of cost (in Rs. crores) | Expenditure incurred upto February 1972 |
|---|---|---|---|
| Chitturpuzha | 1.1 | 5.4 | 1.4 |
| Pamba | 3.8 | 17.9 | 4.7 |
| Pazhassi | 4.4 | 13.2 | 3.1 |
| Kalleda | 13.3 | 45.0 | 2.6 |
| Periyar | 3.5 | 11.5 | 6.5 |
| Kuttiyadi | 5.0 | 12.6 | 7.8 |
| Kanhirapuzha | 3.7 | 9.3 | 2.0 |
| | 34.7 | 114.8 | 28.0 |

The extent of the delay caused by inadequate financial provisi being made for a project, after it is started, will be evident from t history of the Kuttanad Development Scheme. Kuttanad, being one of t important areas of rice production in the State, this scheme was lau with a view to regulating floods and intrusion of salinity from sea waters, and to providing a road-cum-canal between Alleppey and Changanassery — thus connecting the hinterland with the towns; the execution of the project was also expected to help further reclamatio of the Vembanad lake. The total estimated cost of the scheme, on wh work was started in 1951, was originally Rs.1.4 crores. The latest estimate of the cost on the scheme is Rs.4.4 crores, of which only Rs crores has been incurred to date; and the yearly budget provision in recent years has been no more than about Rs.12 to 15 lakhs. At this rate, the project — which was expected to be completed in 1956 — mi well take about three decades for completion.

The burdens imposed on the State by such faulty planning are further aggravated by the terms on which financial assistance has bee made available by the Centre. Until 1969, most of the assistance for irrigation and power projects was given by the Central Government in the form of what were called 'Miscellaneous Development Loans'. Thes loans were repayable in seven annual instalments (from the fourth yea and the interest chargeable was 5½ per cent per annum. It can be sh that, if a State Government borrows a fixed amount — say, Rs.x crore each year on these terms, the servicing obligations (i.e. amortisatio and interest charges) will exceed the amount borrowed each year (i.e. Rs.x crores) within 9 years of the beginning of such borrowing; there continuance of borrowing will lead to a net outflow.

Given below are the amounts borrowed by the State Government by way of 'Miscellaneous Development Loans', and the repayments due on them from the Centre, in each of the years from 1957-58 to 1968-69:

| Year | Receipts (Rs. crores) | Repayments (Rs. crores) |
|---|---|---|
| 1957-58 | 4.50 | - |
| 1958-59 | 4.50 | - |
| 1959-60 | 3.77 | - |
| 1960-61 | 6.14 | - |
| 1961-62 | 6.46 | 0.59 |
| 1962-63 | 12.38 | 1.18 |
| 1963-64 | 13.22 | 3.32 |
| 1964-65 | 19.48 | 3.84 |
| 1965-66 | 31.29 | 5.04 |
| 1966-67 | 17.75 | 6.86 |
| 1967-68 | 12.78 | 8.52 |
| 1968-69 | 6.37 | 14.00 |

The 'Block Loans' that have been extended by the Centre since 1968-69 carry somewhat less onerous terms — they are repayable in 15 annual instalments (though starting from the first year itself) and the interest rate is only 5 per cent per annum — but there is still little relationship between the terms of loan assistance and the nature of the projects for which such financial assistance is given. The resulting financial pressures on the State budget are extremely serious and are likely to come in the way of more rational planning in the future.

## Appendix 3 : A Note on Optimal Land Utilization through Multiple Cropping

There are three important characteristics of agricultural land which need to be kept in mind while allocating this natural resource. The aggregate supply of land is generally inelastic at any time while it need not be so for any particular crop. Second, the quality of land varies due to variations in soil and climatic conditions as well as in the availability of sources of water supply. Though some of the deficiencies can be corrected the quality of land does impose certain technical constraints on the use to which it can be put. Third, the same piece of land can generally be used for growing different crops, either together or in rotation; this makes it possible not only to utilize land intensively but, through careful choice of the crop-mix, to make up in varying degrees for the handicaps imposed by soil, climate and availability of water.

The high rate of growth of population over several decades and the limited growth in the area under cultivation have led to a situation where the land-man ratio is lower in Kerala than in any other State in India. Moreover, since land is unequally distributed, the average size of holdings is — as will be evident from the table below — less than 1 acre for 60 per cent of the operational holdings in the State.

| Deciles (from top to bottom) | Total area operated (in million acres) | Percentage of area operated | Average size of operational holding (in acres) |
|---|---|---|---|
| Top 5 per cent | 1.71 | 37.9 | 13.81 |
| First decile | 2.36 | 52.2 | 9.51 |
| Second " | 0.75 | 10.7 | 3.04 |
| Third " | 0.47 | 10.3 | 1.88 |
| Fourth " | 0.31 | 6.9 | 1.26 |
| Fifth " | 0.22 | 4.8 | 0.87 |
| Sixth " | 0.16 | 3.5 | 0.64 |
| Seventh " | 0.11 | 2.4 | 0.44 |
| Eighth " | 0.08 | 1.7 | 0.31 |
| Ninth " | 0.05 | 1.1 | 0.20 |
| Tenth " | 0.02 | 0.4 | 0.07 |
| All operational holdings | 4.52 | 100.0 | 1.82 |

Source: Survey on Land Reforms in Kerala, 1966-67, Report, Bureau of Economics and Statistics, Government of Kerala (unpublished but available in mimeographed form). This study, based on a sample survey covering 3475 households in the State, contains a very comprehensive account of the structure of land-holdings in each District and is among the best sources of data available in India for analysing the problems associated with distribution of land and with land reforms.

The intensity of use of land is usually also influenced by the nature and extent of the rights which its occupants (i.e. operators) have over it. In Kerala ownership of land has been highly concentrated and consequently the scale of tenancy has also been very high. In fact even as late as 1966-67, only about 1.5 million of the 2.8 million agrarian households in the State owned any land at all; and, of the 3.4 million acres owned by these households, 60 per cent belonged to one-tenth of them. The total area under operational holdings was about 4.5 million acres — since, in addition to the land owned by private households, there was also considerable land belonging to temples, royal families, companies, and other institutions (apart from land

under government management) which were generally leased out to tenants. The area under tenancy was in all a little over 1.9 million acres out of the total operated area of 4.5 million acres.

For a variety of reasons — mainly connected with the earlier evolution of land tenures in Kerala[1] — ownership has been very much more concentrated in the northern districts of the State than in the districts in the south covering broadly the territory of the earlier State of Travancore. Correspondingly the area leased in as a percentage of the total operated area has been also generally much higher in the northern districts. However, even with tenancy on an extensive scale, land holding remained highly concentrated in all parts of the State (as will be evident from the data below relating to 1966-67).[2]

| District | Concentration ratio in the ownership holdings | Total area leased-in as percentage of total area operated | Concentration ratio in the operational holdings |
|---|---|---|---|
| Cannanore | 0.82 | 44.3 | 0.66 |
| Kozhikode | 0.75 | 80.2 | 0.52 |
| Palghat | 0.80 | 67.8 | 0.66 |
| Trichur | 0.71 | 75.3 | 0.69 |
| Ernakulam | 0.66 | 38.6 | 0.64 |
| Kottayam | 0.63 | 30.7 | 0.67 |
| Alleppey | 0.59 | 15.8 | 0.60 |
| Quilon | 0.56 | 1.6 | 0.56 |
| Trivandrum | 0.55 | 2.6 | 0.55 |

The problem of tenancy has been sought to be tackled recently by legislation providing for vesting in the Government all rights, titles and interests of land-owners and intermediaries — free from encumbrances in holdings which are in the possession of cultivating tenants. This law has come into effect from January 1970. Though there are still

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1 T.C.Varghese, Agrarian Change and Economic Consequences: Land Tenures in Kerala, 1850-1950 (Allied Publishers, 1970), Chapters IV-VII.

2 Survey on Land Reforms, op.cit.

many problems to be overcome in assigning the landlords' and intermediaries' rights in the cultivating tenants — mainly for lack of records of tenancies and the consequent difficulty in identifying the cultivating tenant in respect of each holding — one might assume that tenancy will cease to be a widespread phenomenon in Kerala in a few years' time.

Another part of the land reform programme is to impose ceilings on land holdings and distribute the surpluses to those with little or no land. The ceiling fixed in 1963 on a family of not more than five members was 12 standard acres, with provision for one additional standard acre for each member of the family in excess of five, subject to a maximum of 20 standard acres in all for a family. On this basis, the estimated surplus land available in the State was only 0.12 million acres (of which surplus nearly nine-tenth was in the three districts of Cannanore, Kozhikode and Palghat in the northern part of the State).[3] Even this surplus — according to the Land Reforms Survey conducted in 1966-67 — would have been difficult to locate, as there was no record of either the rights on land possessed by all families or of the number of unmarried adult persons in every household. The ceiling has since then been lowered, but this problem remains. It also seems probable that due to further partitions, sales, transfers, etc. in the intervening period the surplus lands available have themselves become smaller.[4]

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3 Land Reforms Survey, Chapter XII, op.cit.

4 "When the Communist Party came into power in Kerala in 1957, big landlords rightly apprehended that their feudal interests on land would be at stake. This fear paved the way for large scale land transfers in the State even before the Agrarian Relations Act of 196[illegible] was adumbrated. The passing of the Agrarian Relations Act in 1960 and the Kerala Land Reforms Act in 1963 also prompted some hectic sales and transfers around those years". Cf. Land Reforms Survey, op.cit., Chapter X.

Moreover, even in the areas in which surpluses can be found, a good part of the land so distributable might be already in smaller operational holdings on account of the extensive scale of tenancy prevalent in these areas. Measures of land reform will, in course of time, confer ownership rights on those who are now tenants and thus reduce the inequalities in the distribution of income originating in agriculture. The size distribution of operational holdings is however not likely to become very different from what it is now — at any rate in the lower ranges. We should expect around 60 per cent of these holdings to be below 1 acre in size — more than half of them to be below 1/2 acre — and only about one-fifth of the operational holdings to be over 2 acres in size.

If there is to be a significant and reasonably adequate increase in incomes in the lower strata it is therefore necessary to explore the scope for raising the productivity of land in the smaller holdings. Rural households in the State depend very considerably on sources of income other than cultivation of land.[5] Though this might have to continue, the problems of unemployment and under-employment and of rural poverty in general would become less acute if higher incomes can be secured in small-sized holdings through more intensive use of land.

The physical configuration of the State has already made possible the growth and development of a diversified cropping pattern. In the

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5 According to the data collected through the All India Rural Debt and Investment Survey, 1961-62, the average value of gross produce per cultivator household in Kerala was only Rs.586 during the year; the average value of the net receipts per cultivator household from industry, trade, transport, miscellaneous professions and services, and salaries and wages amounted however to Rs.655, and "other miscellaneous receipts" (including remittances from migrants) to another Rs.144. In the case of non-cultivator households (in the rural areas), the amounts accruing from these three sources were Rs.0.4, Rs.681 and Rs.92 respectively.

high-land region, where the annual rainfall ranges between 100 and 20 inches, are located the reserve forests of the State; but it also produces tea, cardamom, pepper, rubber, ginger and turmeric on an extensive scale. In the mid-land region, where the annual rainfall ranges from 50 to 150 inches, are grown paddy, banana, arecanut, jack-fruit, mango, cashew and a large variety of other agricultural produc The low-land is narrow, irregular in shape, and consists mainly of recent deposits of sand and alluvium; but it is in this region where most of the coconuts are grown. What needs to be considered is wheth through inter-cropping in each of these regions — where it already exists but could possibly be improved upon — the yield per acre can significantly increased.

Prima facie, the scope for increasing the yield per acre seems be considerable. For instance, the average yield per coconut palm (which is now less than 30 nuts per annum in the State) can be double fairly easily with the varieties now known. It requires, among other things, wider spacing between the palms. The average yield per palm can be further increased if the spacing between the trees is made sti wider. Though the optimal distance between any two coconut palms appears to be 22 feet if only coconuts are being grown and the object is to maximize the output of nuts per acre,[6] wider spacing would perm

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6 "Where the palms are over-croded they grow tall and lanky and fail to give satisfactory yield due to the intense competition between palms for nutrients, moisture, light or air. In India the general recommendation is a spacing of 7½ to 9 metres for the ordinary ta palms". The effect of spacing on the yield per palm and on the to yield per acre is evident from the results of some experiments don in Jamaica:

| Spacing (sq.feet) | Palms per acre (number) | Average number of nuts per palm | Average number of nuts per ac |
|---|---|---|---|
| 22 | 90 | 53.5 | 4815 |
| 25 | 69 | 68.1 | 4699 |
| 30 | 48 | 91.4 | 4387 |
| 35 | 35 | 95.1 | 3329 |

Cf. P.K.Thampan, Coconut Culture in India (1972), Chapter 4.

## Appendix IV

## Under-nourishment and Malnutrition in Kerala and Its Implications for Planning

The intensity and scale of under-nourishment and malnutrition in Kerala have been differently assessed.[1] According to one recent study — based on data on consumer expenditure collected through the National Sample Survey — about 90 per cent of the population in the State could not afford in 1961-62 a diet that was adequate even in terms of calories.[2] According to this study, the percentage of such under-nourished people was much lower in other States — being only around 13 to 14 per cent of the rural population of Rajasthan, Punjab, and Jammu and Kashmir, 18 to 19 per cent in the rural areas of Uttar Pradesh and Gujarat, and between 40 and 60 per cent among the rural population of Orissa, West Bengal, Assam and Tamil Nadu.

It is evident on closer examination of these data that the estimated percentage of the under-nourished depends to a large extent on the prices at which different items of food in each State have been valued. While a total consumption expenditure of Rs.120 per capita per annum was sufficient (according to this study) to provide the minimum calorie requirements in Rajasthan, the corresponding expenditure required in Kerala was over Rs.400 (in both cases at the prices prevailing in 1961-62).

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1 If a person does not secure the minimum caloric requirement from his food intake the result is likely to be "under-nourishment"; if the caloric requirements are satisfied, but there is deficiency in respect of proteins or other nutrients it would lead to "malnutrition".

2 V.M.Dandekar and Nilakantha Rath, Poverty in India, (1971), Chapter 1.

An attempt was therefore made in the Centre for Development Studies to investigate first whether the price of the various items of food required was in fact so high and the required nutritional needs could not be met in Kerala at lower cost. For this purpose, 57 items of food normally available in the State were taken into account, their nutritional properties identified, and their prices in 1970-71 ascertained. The minimum nutritional needs were taken to include not only calories but proteins, iron, vitamins, etc. Least-cost diets for securing the minimum nutritional requirements were then worked out by linear programming, and adjustments made to take into account the tastes and palatability considerations of the population of the State.

The main finding of the study (the results of which have been published)[3] is that an expenditure of Rs.1.13 per person should have been enough at the prices prevailing in 1970-71 (which were nearly twice as high as in 1961-62) to provide a diet yielding 2800 calories, about 83 grams of proteins, 60 milligrams of iron, 52 milligrams of Vitamin C, over 3000 IU of Vitamin A, etc. Too much importance need not (indeed should not) be attached to the particular composition of the diet which — according to this exercise — would have provided nutrients of this variety and magnitude. What is more important is the demonstration that all the minimum nutritional requirements could conceivably be secured in Kerala at about one-half of the cost estimated in the earlier study.[4]

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3 See P.G.K.Panikar, "Economics of Nutrition", Economic and Political Weekly, Annual Number, February 1972 (See, in particular, Table 8, Model VIII).

4 It should be added that the 57 items covered by this exercise do not include fruits such as mango, jack-fruit and banana, that are available in plenty in Kerala and are valuable supplements to the diet of the poorest sections of the population.

It does not of course follow that there is no under-nutrition or mal-nutrition in Kerala, or that the scale of such under-nutrition and/or mal-nutrition cannot be very considerable. One has to consider the distribution of consumption expenditure and see what proportion of the population could afford expenditure of this magnitude. It is also necessary to investigate whether, even if the entire population of the State had incomes sufficient to afford a diet of the kind postulated, there were enough supplies of the different items of food concerned to sustain such a diet for everyone.

Let us assume, on the basis of the second study referred to above, that a daily per capita total consumer expenditure of 60 to 70 paise would have been enough, at the prices prevailing in 1961-62, for all the minimum nutritional needs to be met. This would work out to around Rs.220 to 255 per capita per annum. It is evident from the data collected through the National Sample Survey in 1961-62 (17th Round, Central Sample) that the total consumer expenditure per capita was over Rs.560 per annum, on the average, among the top decile of the rural population of Kerala, and nearly Rs.235 per annum for even the fifth decile from the top; but it was lower than Rs.200 per annum for the remaining five deciles at the bottom. It appears therefore that about one-half of the population of the State were likely to have been subject to varying degrees of under-nutrition/mal-nutrition. There is no reason to think that the position has substantially changed in the course of the subsequent decade.

The next question that arises therefore is whether, in case the inequalities in consumption could be eliminated, the supplies of

food available in the State would be adequate to meet the minimum nutritional needs of everyone. With this view, an attempt has been made to construct a food balance-sheet for Kerala on the basis of th available data for the period 1963-64 to 1965-66. It appears from this exercise — the full details of which will be shortly presented in a separate paper — that the supplies of food available in the St towards the middle of the 'sixties would have yielded nearly 2100 calories, over 40 grams of protein, and about 60 grams of fat.

It is difficult to be sure what exactly is the minimum averag calorie requirement in the State since it depends on the climate, th occupation of different sections of the people, their body-build, se age and several other such factors. The Indian Council of Medical Research has placed the average per capita requirement of calories a 2400, and of proteins at 44 grams, for India as a whole. But the average minimum per capita calorie requirement even for India has be taken by some to be only 2250 calories;[5] and for Ceylon — which cli tically and otherwise is very similar to Kerala — at no more than 1930 calories.[6] As for fat, the daily intake needed is believed to b in the range of 45 to 60 grams. Prima facie, the supplies of food available in Kerala appear to be therefore not much below what would be needed for meeting the minimum nutritional requirements of the people if these supplies were equally distributed.

It is interesting to observe that the availability of calorie and proteins per capita per day, as well as their sources, are about

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5 Dandekar and Rath, op.cit.

6 Thambapillai Jogaratnam and Thomas T.Poleman, Food in the Economy of Ceylon (Cornell International Agricultural Development Bulleti 11, October 1969), Table 20.

the same in Kerala as in Ceylon where the diet is believed adequate to meet average energy requirements. The relevant estimates — derived in both cases from food balance-sheets — are reproduced below:

Table 1: Food Intake and Their Nutrient Values, Ceylon and Kerala

| Commodity | Ceylon (1955-60) | | Kerala (1963-66) | |
|---|---|---|---|---|
| | Calories | Proteins | Calories | Proteins |
| Cereals | 1200 | 22.6 | 966 | 22.1 |
| Rice | 950 | 16.3 | 866 | 18.8 |
| Others | 250 | 6.3 | 100 | 3.4 |
| Roots and tubers | 74 | 0.6 | 332* | 1.5 |
| Sugar | 190 | 0.0 | N.A. | N.A. |
| Pulses and nuts | 58 | 12.7 | 465@ | 5.6 |
| Vegetables | 28 | 1.7 | N.A. | N.A. |
| Fruits | 9 | 0.1 | 144 | 2.2 |
| Meat | 12 | 0.8 | 3 | 0.6 |
| Fish | 60 | 7.1 | 42 | 7.9 |
| Eggs | 4 | 0.3 | 3 | 0.3 |
| Milk | 13 | 0.7 | 19 | 0.8 |
| Fats and oils | 477@ | 0.7 | 118 | 0.7 |
| Total | 2125 | 47.3 | 2092 | 41.0 |

* Includes tapioca @ Includes coconuts

Source: Jogaratnam and Poleman, op.cit., Table 22.

If this assessment of per capita availability of food in Kerala is correct, such under-nourishment and mal-nutrition as exists in the State must be attributed mainly to inequalities in the distribution of the available supplies. The extent of these inequalities, in respect of some of the main items of food, will be evident from the following data relating to 1961-62.

Table 2: Distribution of Expenditure on Different Food Items Among Different Expenditure Groups

| Decile | Percentage Share of each Decile in Total Expenditure on | | | |
|---|---|---|---|---|
| | Cereals and Cereal Substitutes | Pulses | Milk and Milk products | Other food items |
| First | 13.3 | 28.2 | 32.9 | 21.4 |
| Second | 11.7 | 16.3 | 17.0 | 14.8 |
| Third | 11.0 | 12.6 | 12.4 | 12.4 |
| Fourth | 10.7 | 10.3 | 9.8 | 10.7 |
| Fifth | 10.0 | 8.5 | 7.8 | 9.4 |
| Sixth | 9.6 | 7.2 | 6.4 | 8.4 |
| Seventh | 9.3 | 5.9 | 5.1 | 7.3 |
| Eighth | 8.8 | 4.9 | 3.9 | 6.4 |
| Ninth | 8.2 | 3.7 | 3.0 | 5.4 |
| Tenth | 7.4 | 2.4 | 1.7 | 3.8 |
| | 100.0 | 100.0 | 100.0 | 100.0 |
| Lorenz ratio | 0.17 | 0.58 | 0.45 | 0.27 |

Estimated from the National Sample Survey, Seventeenth Round, Number 135, September 1961 - July 1962.

A major policy question to be faced in planning is to what extent the problems of under-nourishment and mal-nutrition in the State can be solved — at least temporarily — through measures for more equitable distribution of the available supplies of items of food like pulses and milk, and to what extent they require expanding the output of specific items needed to meet the nutritional deficiencies. The following observation of Dr. P.V.Sukhatme is of particular relevance in this context:

> "The green revolution will undoubtedly help to increase the supply of foodgrains but increasing supply in itself will not be adequate to solve the problem of uneven distribution.....It is therefore important that we involve the

> small farmer as fast as we can into the effort of production, not only of crops but of milk as well..... It has been aptly said that 'it is not food, but the small farmer which is the dark spot of the future'."[8]

Dr. Sukhatme adds:

> "It would appear....prudent that we do not create dietary variety more than we can help by encouraging factory production of semi-conventional foods which, in any case, have little to offer by way of nutritional value over and above the cereal/pulse diet. Far from closing the so-called protein gap, it is not unlikely that such production will only help to widen it. Rather, our aim should be to try and integrate wherever possible food production, distribution and employment. Even if adequate supplies of protein-rich foods are available, they would not be of help in the solution of the problems of malnutrition if the poor cannot afford to buy adequate amounts of foodgrains and are even less likely to afford protein-rich food for their children".

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8 P.V.Sukhatme, "Protein Strategy and Agricultural Development", Presidential Address delivered on the occasion of the 31st Annual Conference of the Indian Society of Agricultural Economics in March 1972, Indian Journal of Agricultural Economics, Vol. XXVII, No.1, January-March 1972.

## Appendix V: A Note on Housing

The only source of data on housing conditions in Kerala is the 1961 Population Census. (Census of India 1961, Vol. V, Kerala, Part IV A, Report on Housing and Establishments and Part IV B, Housing and Establishments Tables, 1964). As of 1961, Kerala had 2.91 million Census households, of which 2.50 million were rural and 0.41 million urban. The average size of a Census household was 5.76; among rural households it was 5.71 and among urban households 6.05. The Census reported 2.74 million as dwellings — of which 2.37 million were in rural areas and 0.37 million in urban areas.

About 88 per cent of the Census households were estimated as owning their dwellings, only 12 per cent living in rented houses. It should be noted however that, according to the definitions used in the Census, even "cases where the occupants have only a tenancy right were also deemed to fall in this ('owned') category wherever there was permanency of tenure".

The Census Report contains some data relating to the type of dwellings — based on analysis of a 20 per cent sample. The following tables gives the distribution of households according to the predominant material of wall and roof.

### Distribution of 1000 Households Living in Census Houses, used wholly or partly as Dwellings, classified according to predominant material of wall

| Wall material | Rural | Urban |
|---|---|---|
| Grass, leaves, reeds or bamboo | 161 | 144 |
| Timber | 39 | 56 |
| Mud | 304 | 120 |
| Unburnt bricks | 156 | 177 |
| C.I. Sheet or other metal sheets | Negligible | Negligible |
| Stone | 296 | 439 |
| Cement Concrete | Negligible | Negligible |
| All other materials | 1 | Negligible |

Distribution of 1000 Households Living in Census Houses, used wholly or partly as Dwellings, classified according to predominant material of roof

| Roof Material | Rural | Urban |
|---|---|---|
| Grass, leaves, reeds, thatch, wood or bamboo | 770 | 567 |
| Tiles, Slate, Shingle | 219 | 427 |
| Corrugated iron, zinc or other metal sheets | 6 | 1 |
| Asbestos and Cement Sheets | 5 | Negligible |
| Brick and Lime | Negligible | Negligible |
| Concrete | Negligible | 5 |
| All other materials | Negligible | 0 |

Stone and brick walls were reported in about 50 per cent of the rural households and 68 per cent of the urban households. Roofs of til slate and shingle were however reported by only about 22 per cent of th rural and about 43 per cent of the urban sample households.

We get some insight into the adequacy of the housing from the analysis of the number of rooms among the Census households. The following table presents data on the distribution of households accordi to the number of rooms.

Sample Households Classified by Number of Rooms Occupied

| Number of Rooms | Number of Households | Number of Members | |
|---|---|---|---|
| | | Males | Females |
| No regular room | 7783 | 20409 | 20820 |
| One room | 179757 | 434440 | 447362 |
| Two rooms | 177469 | 508991 | 522910 |
| Three rooms | 101233 | 316985 | 324065 |
| Four rooms | 46229 | 157327 | 149483 |
| Five rooms or more | 49014 | 183266 | 185602 |

The average number of persons per room would bring out more clearly the standard of housing available. From the foregoing table we derive the following.

Number of Persons per Room among Households of Different Strata

| Household Classes | Total No. of Rooms | Total No. of Persons | Persons per room |
|---|---|---|---|
| One roomed houses | 179757 | 881802 | 4.91 |
| Two roomed houses | 354938 | 1031901 | 2.91 |
| Three roomed houses | 303699 | 641050 | 2.11 |
| Four roomed houses | 184916 | 316810 | 1.71 |

Note: The total number of rooms is estimated for the last class at the rate of 5 rooms per household.

If the average size of a household is 5.71, and they comprise 2 adults and 3 non-adults, two rooms per household should be considered an irreducible minimum by any norm. It should be noted that the Census definition of a room is that it is any enclosed room that is used for living, dining, storing or cooking. In terms of the criterion indicated above, about 35 per cent of the households in Kerala would fall below the desirable minimum level of housing.

It might not be practicable to implement within a period of five years — or even a decade — a programme for constructing houses adequate to correct all the existing inadequacies. But what can perhaps be attempted is a programme that seeks to remove the more glaring of these inadequacies within a decade. This can be done in part by merely making marginal improvements in existing dwellings — such as by providing arrangements for sanitation where they do not exist, substitution of roofs made of relatively durable materials for roofs which require replacement every year, etc. Low-cost houses could also be constructed for the poorest sections of the population — particularly since construction technology suited to the most pressing needs of those who

are not well-off, and costing no more than about Rs.5 to 6 per square foot, is now available within the State. In real terms, most of the resources needed for this type of housing are labour and locally-available materials like bricks, tiles and timber. It should be poss to construct about 3/4 million new houses (each around 600-800 sq.ft. in area) for a total cost of approximately Rs.300 crores. If such a construction programme is spread over a decade, and tied up with the schemes for creating more employment, the resource constraints (the most important of which are likely to be organizational and supervis skills) might not prove too serious. In fact, since people are gener willing to save more for having houses of their own, a housing progra of this kind might itself generate part of the additional saving needed for such investment.